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US ARMY MEDICAL RESEARCH AND DEVELOPMENT REPORT

Colonel Charles M. Dettor

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US ARMY MEDICAL BIOENGINEERING RESEARCH and DEVELOPMENT LABORATORY
Fort Detrick
Frederick, Md. 21701

1 October 1978

Annual Progress Report for Period 1 October 1977 - 30 September 1978

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US ARMY MEDICAL RESEARCH AND DEVELOPMENT COMMAND
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PREFACE

The United States Army Medical Bioengineering Research and Development Laboratory (USAMBRDL), a subordinate unit of the United States Army Medical Research and Development Command (USAMRDC), is located at Fort Detrick, Maryland, at the apex of a triangle between Baltimore and Washington on the outskirts of the City of Frederick.

The unit was established on 1 September 1972 by the merger of the US Army Medical Equipment Research and Development Laboratory (USAMERDL) and the US Army Medical Biomechanical Research Laboratory (USAMBRL). On 1 July 1973, USAMBRDL was directed to absorb the resources and mission of the US Army Medical Environmental Engineering Research Unit (USAMEERU), located at Aberdeen Proving Ground (Edgewood Arsenal), Maryland. This action was completed on 30 October 1973, with the simultaneous discontinuation of USAMEERU and the formation of the Environmental Protection Research Division within USAMBRDL. By September 1974, all of the division's personnel and material resources had been relocated to Fort Detrick.

Organized in September 1921 at Carlisle Barracks, Pennsylvania, the former USAMERDL was established to provide engineering development of medical items required for field use of the Army. During the years 1946-1957 the laboratory was under the command of the former Army-Navy Medical Procurement Office, and in 1948 was moved to Fort Totten, New York. Subsequently, under the technical supervision of the Armed Services Medical Materiel Coordination Committee, it came under complete control of the Army in June 1962 as a subordinate element of The Surgeon General's Research and Development Command. USAMERDL through the years continued to develop and improve upon medical materiel peculiar to the needs of the Armed Forces.

Established in 1946 by the Army Medical Service, the former USAMBRL was originally known as the Army Hand Laboratory, and later changed to Army Prosthetics Research Laboratory (APRL). During the early years, APRL research involved the development of new prosthetic devices. Around 1955, the research effort became more diversified and included the development of new surgical repair materials. With the expansion of the mission to include internal body prosthetics, the name of the laboratory was changed in 1963 to US Army Biomechanical Research Laboratory.

The former USAMEERU was activated on 1 July 1972. USAMEERU represented a major Army "first" since its mission, which was to conduct continuing environmental health engineering research in support of The Surgeon General's responsibilities in air and water pollution control and abatement.

Today, USAMBRDL's facilities are housed in five separate buildings and a wastewater pilot plant on Fort Detrick with total floor space exceeding 100,000 square feet. In addition, the laboratory maintains a small technical coordinating office at Aberdeen Proving Ground, Maryland (Edgewood area). Although geographic separation tends to isolate functions and stretch communication lines, laboratory personnel have proved resourceful in minimizing these problems.

With the exceptions that USAMBRDL no longer performs research in the area of prosthetic devices or surgical materiel and there is much greater emphasis on pest management research, current missions can be traced back to the original three laboratories. Not surprisingly, these missions reflect a highly interdisciplinary staff and the need for a responsive and flexible management structure. Current missions are as follows:

Conducts in-house and extramural research, development and acquisition of medical, dental and pest management materiel on a continuing basis for the Army and on an as required basis for the Navy and Air Force. This includes managing the developer's portion of the AMEDD materiel life cycle and products improvement programs, coordinating an integrated pest management program, and constructing initial pilot prototypes, test models, and producing limited quantities of medical materiel to support urgent military requirements.

Conducts comprehensive basic and applied research and management of research contracts in support of all The Surgeon General's responsibilities in environmental protection to include air, land and water pollution control and solid, hazardous/toxic wastes and pesticide disposal; and occupational health associated with exposure to chemicals.

To accomplish these missions, the laboratory is authorized 131 positions consisting of 17 officers, one warrant officer, 11 enlisted personnel, 103 general schedule civilians and nine wage grade civilians. In addition, the personnel complement is enhanced through various cooperative training programs with universities, colleges and other government agencies. Professional disciplines represented in the organization include:

Aquatic Biology
Biomedical Engineering
Chemical Engineering
Chemistry
Computer Sciences
Electrical Engineering
Electronic Engineering
Engineering Crafts & Drafting
Entomology
General Engineering

Graphic and Photographic Arts
Microbiology/Virology
Mechanical Engineering
Operations Research
Pathology
Physiology
Sanitary Engineering
Statistics
Toxicology/Pharmacology
Veterinary Medicine

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HEALTH STANDARDS FOR MILITARY POLLUTANTS

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28. GENERAL USE Foreign Intelligence Not Applicable									
29. KEYWORD (Printed with Security Classification Code) ¹¹ (U) Identification; (U) Mass Spectrometry; (U) Gas Chromatography/Mass Spectrometry; (U) Analysis; (U) Pesticides; (U) Water									
30. TECHNICAL OBJECTIVE, ¹² 31. APPROACH, 32. PROGRESS /Printed individual paragraphs identified by number. Proceed last of each with Security Classification Code: 23. (U) To adapt the present instrumentation for use with capillary gas chromatographic columns. To support other in-house or extramural research projects through the identification of unknown compounds in the areas of pesticide disposal, trace organics in water, hazardous waste disposal, and installation restoration standards. 24. (U) Techniques for using capillary columns will be applied from the literature and from other laboratories actively engaged in capillary gas chromatography/mass spectrometry. Analytical approaches will be tailored to meet specific requirements for determination of unknowns as they occur. 25. (U) 7710 - 7809. The mass spectrometer was used to determine the various components of the emulsifiers used in commercial and DA diazinon formulations. Products of the dechlorination of arochlores and chlordane formulations were determined. Purity and composition of compounds were determined for compounds to be used in toxicity testing in conjunction with the installation restoration effort. Various surfactants were tentatively identified in two formulations of Aqueous Film Forming Foam. This effort will become part of water and wastewater analytical support and will not be a separate research work unit.									
POC:DA									

DETAIL SHEET

TITLE: Development and Application of Gas Chromatography/Mass Spectrometry Techniques for Army Environmental Studies

WORK UNIT NO: 121

AGENCY ACCESSION: DA OB 6186

PRINCIPAL INVESTIGATOR: Cooper, W.J.

BACKGROUND

Gas chromatography combined with mass spectrometry is a valuable analytical tool. Gas chromatography is used to separate and quantitate components in complex mixtures of volatile organic compounds. Mass spectrometry is used in the identification of unknown compounds. Thus, the advent in the middle 1960's of combined gas chromatography/mass spectrometry (GC/MS) has led to a relatively rapid method for separating and identifying individual organic compounds when they are present in a complex mixture. Mixtures of individually synthesized compounds can also be confirmed by conventional methods of sample introduction, using either direct probe or batch inlet systems. The gas chromatograph can be equipped with various types of packed columns or capillary columns for high resolution gas chromatography. The mass spectrometer can be operated with the traditional electron impact source or with the combined electron impact/chemical ionization source. The advantage of chemical ionization is its ability to produce molecular ions which undergo less fragmentation in the source and therefore are useful in molecular weight determination.

The use of GC/MS is well-documented in the literature as it applies to general environmental problems. As it applies to the mission of the EPRD it has been used to determine the chemical degradation products of pesticides and pesticide formulations, to confirm the identification of phenol derivatives used for phenolic determinations in water for reuse, and to characterize the organic constituents in water for reuse.

PROGRESS

The gas chromatograph/mass spectrometer (GC/MS) was used to identify various impurities in chemicals intended for toxicological testing and in one case proved that a chemical had been mislabeled.

A number of hydrocarbons were identified in the emulsifiable concentrate of diazinon formulations. These included xylenes, methyl and ethyl benzenes and a number of other aromatic compounds.

The dechlorination products of Arochlor were studied and determined.

Surfactants present in Aqueous Film Forming Foam were tentatively identified in support of a contract with Dr. E.S.K. Chain at the University of Illinois.

REFERENCES

Cooper, W.J. and W.H. Dennis, Jr., "Catalytic Dechlorination of Organochlorine Compounds. IV. Mass Spectral Identification of DDT and Heptachlor Products," Chemosphere, 7:299 (1978).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL	
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10. NO./CODES ⁶	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
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12. SCIENTIFIC AND TECHNOLOGICAL AREAS 011700 Operations Research; 005900 Environmental Biology; 01680 Toxicology							
13. START DATE 7610	14. ESTIMATED COMPLETION DATE 8110	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House				
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RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434	PRINCIPAL INVESTIGATOR (Provide name if U.S. Army contractor) NAME: Small, M.J. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER ASSOCIATE INVESTIGATORS NAME: Pearson, J.G. NAME:						
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21. KEYWORDS (Provide each with Security Classification Code)
(U) Systems Analysis; (U) Toxicology; (U) Environmental Models; (U) Munitions; (U) Installation Restoration; (U) Occupational Health; (U) Hazards

22. TECHNICAL OBJECTIVE⁷ OR APPROACH⁸; 23. PROGRESS (Provide individual paragraphs identified by number. Provide code of each with Security Classification Code)
23. (U) Stanford Research Institute, under Contract DAMD 17-75-C-5071, has devised a systems analysis approach to rank environmental hazards from Army-unique or relevant pollutants and recommend resource allocations to most efficiently formulate standards criteria. This project will provide the means to operate the software, to update the data inputs necessary for its most credible execution and update the analysis algorithms to keep pace with changing philosophies and hazard areas that can be addressed.

24. (U) During FY79, the methodology will be used to handle case studies requested by Research Area Managers in Munitions and Occupational Health. In the latter case, a standardized approach to data input and uncertainty assignment procedures will be developed. By liaison and monitoring of activities in environmental models, toxicology result assessment and regulatory agency policy attitudes, the methodology will be updated.

25. (U) 7710 - 7809. A case study was performed on the advisability of doing long-term mammalian and aquatic bioassay studies of TNT and TNT-related compounds in condensate water and other significant wastewater discharges associated with TNT production. A technical report was written detailing procedures and results of the study. The occupational health computer program package was debugged and put into operating condition on the MISD IBM 360/50 Computer System at Fort Detrick. Modified research allocation programs were written to deal with hazard computations that are handled poorly by the existing program packages. A users manual for all programs was prepared.

DETAIL SHEET

TITLE: Hazard Ranking and Allocation Methodology Management

WORK UNIT NO: 122

AGENCY ACCESSION NO: DA OB 6187

PRINCIPAL INVESTIGATOR: Small, M.J.

BACKGROUND

SRI, International, under Contract DAMD 17-75-C-5071, has devised a systems analysis approach. The analysis recommends cost-effective resource allocations to formulate the data-base for criteria related to occupational and environmental chemical standards.¹ Central features of the approach are quantitative estimations of the real-world hazards due to chemical occupational exposure and pollution and an analysis of the accuracy of these hazards before and after proposed research options. This analysis is now operational at this laboratory. This project provides the means to operate the software to meet research area needs and to update the systems analysis algorithms and concepts to be relevant to changing philosophies and interpretations of data.

PROGRESS

A case test study was performed on the advisability of doing long-term mammalian and aquatic bioassay studies of TNT and TNT-related compounds in condensate water and other significant wastewater discharges associated with TNT production.² The occupational health computer program package was debugged and put into operating condition on the MISD IBM 360/50 Computer System at Fort Detrick. A user's manual for all programs was prepared.³

REFERENCES

1. Brown, S.L., J.M. Cohen, N.I. Macrae and M.J. Small, "Setting Priorities for R&D on Army Chemicals," Final Report for Contract DAMD 17-75-C-5071 (Draft), CRESS Report No. 56, SRI, International, Menlo Park, CA (May 1978).

2. Small, M.J., "The Hazard Ranking and Allocation Methodology: Evaluation of TNT Wastewaters for Continuing Research Efforts," Technical Report 7808, US Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, MD (Sep 1978).
3. Small, M.J., "The Hazard Ranking and Allocation Methodology: Systems Analysis Users Guide," Unpublished (Aug 1978).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL
3. DATE PREV SURVEY	4. KIND OF SUMMARY	5. SUMMARY ACTV ^b	6. WORK SECURITY ^b	7. REGRADING ^b	8. DISSEM INSTRN ^b	9. SPECIFIC DATA-CONTRACTOR ACCESS
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ^a	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	62720A	3E162720A835		00	123 APC F691	
B. CONTRIBUTING						
C. XREF/REF ID	CARDS 114F					
11. TITLE (Print in block with Security Classification Code) ^b (U) Aquatic Toxicity Testing of Chemicals Related to Munitions Production, Pesticide Disposal, and Hazardous Waste Disposal						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ^a 005900 Environmental Biology; 016800 Toxicology						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7610	7909	DA		C. In-House		
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (in thousands)
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL	PREVIOUS	1.6	52	
B. NUMBER:		YEAR	CURRENT	1.1	48	
C. TYPE:	E. AMOUNT:	21. PERFORMING ORGANIZATION				
D. KIND OF AWARD:	F. CUM. AMT.:	NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
22. RESPONSIBLE DOO ORGANIZATION				PRINCIPAL INVESTIGATOR (Print in block if U.S. Academic Institution) NAME: Miller, T.A. TELEPHONE: (301) 663-2036; AUTOVON 343-2036		
23. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Pearson, J.G. NAME: Broich, S.G.		
24. KEYWORDS (Print in block with Security Classification Code) (U) Munitions; (U) Pesticides; (U) Aquatic Toxicology; (U) Hazardous Wastes				POC:DA		
25. TECHNICAL OBJECTIVE ^a ; 26. APPROACH; 28. PROGRESS (Print in individual paragraphs identified by number. Precede text of each with Security Classification Code.) 23. (U) To provide aquatic toxicity data required in conjunction with in-house and extramural research related to munitions production, pesticide management, and hazardous waste disposal.						
24. (U) To conduct aquatic toxicity testing through comparative screening tests and through generation of acute toxicity data; to evaluate state-of-the-art toxicity testing methods to determine applicability to research requirements; to advance the state-of-the-art in toxicity testing methods where research requirements must be met with existing methods.						
25. (U) 7710 - 7809. Aquatic toxicity values for a number of munitions-related compounds were generated using daphnia, fathead minnows, and bluegills. A technical report on the findings is in preparation.						

DETAIL SHEET

TITLE: Aquatic Toxicity Testing of Chemicals Relative to Munitions Production, Pesticide Disposal, and Hazardous Waste Disposal

WORK UNIT NO: 123

AGENCY ACCESSION NO: DA OB 6188

PRINCIPAL INVESTIGATOR: Miller, T.A.

BACKGROUND

This work unit was originally established to support the EPRD extramural program in munitions criteria development by (1) providing quality chronic toxicity testing, and (2) providing quality control testing capability in relation to toxicity testing conducted by contractors. Although efforts under this work unit are limited to those supporting munitions criteria development, the laboratory facilities and the staff have actually supported a number of other EPRD work units, those efforts having been documented and managed under the supported work unit.

PROGRESS

The following 12 munitions-related compounds were evaluated for acute toxicity to either fathead minnows (Pimephales promelas) or green sunfish (Lepomis cyanellus), and to Daphnia magna: hexamine; nitroguanidine; methylamine; dimethylamine; trimethylamine; tetryl; 2-nitrodiphenylamine; diphenylamine; triacetin; sodium hypophosphite; cyclo-hexanone; and dibutyl phthalate.

Using a criteria of LC/EC50 between 1 and 10 mg/l as toxic, and 1 mg/l as highly toxic and requiring consideration for additional testing, only five compounds were found to be toxic or highly toxic.

2-Nitrophenyl, triacetin, tetryl, and dibutyl phthalate were toxic to daphnia, while diphenylamine was highly toxic. In contrast only 2-nitrodiphenylamine and diphenylamine were toxic and tetryl was highly toxic to fathead minnows. Hexamine, nitroguanidine, and sodium hypophosphite were not toxic at levels near their limits of solubility. The remaining compounds had EC50's ranging from 32 to 763 mg/l for daphnia and LC₅₀'s of 210 to 1150 mg/l for fatheads.

With the exception of triacetin, and possibly trimethylamine, the toxicity of the test material to daphnia and fish was similar. Trimethylamine was five to six times more toxic to daphnia than to fatheads and triacetin was much more toxic to daphnia than fish (EC50 of 1-5 mg/l vs LC50 of 228 mg/l).

Based on the similarity of results with daphnia and fish, and the relatively low toxicity of most materials tested, data are believed to be sufficient to conclude that additional testing may be required only for tetryl, diphenylamine, and 2-nitrodiphenylamine.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b DA OB 6228	2. DATE OF SUMMARY ^b 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY K. COMPLETION U	5. SUMMARY ACTY ^b U	6. WORK SECURITY ^b U	7. REGRADING ^b NA	8. DISSEM INSTRN ^b NL	9. SPECIFIC DATA: CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ^b a. PRIMARY b. CONTRIBUTING c. OTHERXXXXXX	PROGRAM ELEMENT 62720A	PROJECT NUMBER 3E162720A835		TASK AREA NUMBER 00	WORK UNIT NUMBER 124 APC F698	
11. TITLE (Provide with Security Classification Code) (U) Problem Definition Study on Disposal of Army Hazardous Wastes						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 003300 Chemical Engineering; 005900 Environmental Biology						
13. START DATE 7710	14. ESTIMATED COMPLETION DATE 7809	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)
a. DATES/EFFECTIVE: b. NUMBER: c. TYPE: d. KIND OF AWARD:		FISCAL YEAR	PRECEDING 78	CURRENT 79	0.2 0.0	07 00
e. EXPIRATION:						
f. AMOUNT: g. CUM. AMT.:						
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Provide name if U.S. Academic Institution) NAME: Warner, M.C. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER ASSOCIATE INVESTIGATORS NAME: Meier, E.P. NAME: POC:DA				
23. KEYWORD (Provide each with Security Classification Code) (U) Hazardous Materials; (U) Pollution; (U) Aquatic Toxicology; (U) Toxicity; (U) Disposal; (U) Hazardous Wastes; (U) Solid Wastes						
24. TECHNICAL OBJECTIVE, * 25. APPROACH, 26. PROGRESS (Provide individual paragraphs identified by number. Provide code of each with Security Classification Code.)						
23. (U) To identify existing and potential Army problems in disposal of hazardous wastes; to determine if acceptable disposal methods are available for these wastes; and, to identify those problems that require R&D effort to produce acceptable disposal methods. Recent state and federal legislation has placed stringent controls on the disposal of hazardous wastes. Federal law places responsibility for safe disposal of these wastes on the owner. In many cases there are no acceptable disposal methods and the Army's wastes must be stored until a safe disposal method can be found. The Army must identify its problems in this area and develop safe disposal methods when necessary.						
24. (U) A problem definition study will be performed to identify Army problems in disposal of hazardous wastes. This information will be obtained by contacting the environmental offices of the major commands, the Defense Logistics Agency and other commands as they are identified. DARCOM Program Managers will be contacted to determine what planning is required for potential waste problems that may occur as a result of development, manufacture, use, and disposal of new materials. Site visits, to obtain detailed information, will be made to those installations where problems in hazardous waste disposal have been identified. Current disposal procedures will be reviewed (literature review, on-going R&D, legislation, etc.) and requirements for R&D will be identified.						
25. (U) 7710 - 7809. It was determined that the responsibility for disposal of hazardous wastes within DA and DOD has not been identified by DOD. Until such responsibilities are defined no further action is possible.						

*Available to contractors upon originator's approval.

DD FORM 1498
1 MAR 68

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

DETAIL SHEET

TITLE: Problem Definition Study on Disposal of Army Hazardous Wastes

WORK UNIT NO: 124

AGENCY ACCESSION NO: DA OB 6228

PRINCIPAL INVESTIGATOR: Warner, M.C.

BACKGROUND

This research was initiated through coordination with USAEHA and was intended to (1) identify the hazardous waste disposal problems at Army depots and installations, and (2) compile data on existing methods of safe disposal. It was further planned to undertake the R&D efforts necessary to provide safe methods of disposal in cases where no methods exist.

PROGRESS

A large number of telephonic communications, personal contacts and site visits were made to obtain and consolidate information on Army hazardous wastes. USAEHA, DARCOM, DLA, TRADOC HQ (Environmental Conference), GMPA (New Cumberland Army Depot) and the Sixth National Congress on Waste Management were visited or attended and discussions were conducted to gain insight into existing hazardous waste disposal problems. In addition to developing comprehensive listings of hazardous chemicals, it was also determined that chlorinated lime, calcium hypochlorite, and ferric chloride in storage in several Army depots required immediate safe disposal. Further activity on this work unit has been terminated pending a DOD position on DA responsibilities for disposal of hazardous wastes, and responsibility for attendant R&D efforts.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL		
3. DATE PREVIOUS SUMMARY		4. KIND OF SUMMARY	5. SUMMARY ACT ^c	6. WORK SECURITY	7. REGRADING	8. DOD/NINSTN ^d	9. SPECIFIC DATA ^e CONTRACTOR ACCESS	10. LEVEL OF SUM A. WORK UNIT
77 10 07		K. COMPLETION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO./CODES ^f		PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY		62720A	3E162720A835		00	125 APC F697		
B. CONTRIBUTING		XXXXXXX	CARDS 114F					
11. TITLE (Provide with Security Classification Codes) (U) Evaluation of Chemical Fixation Processes for Disposal of Army Hazardous Wastes								
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ^g 007800 Hygiene and Sanitation; 012700 Physical Chemistry								
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7710		7810		DA	C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS			20. FUNDS (in thousands)	
A. DATES/EFFECTIVE:		EXPIRATION:		FISCAL YEAR	PRECEDING	CURRENT		
B. NUMBER:				78	1.7	45		
C. TYPE:		4. AMOUNT:		79	0.0	00		
D. KIND OF AWARD:		E. CUM. AMT.:						
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION						
NAME ^h : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁱ : Fort Detrick, Frederick, MD 21701		NAME ^h : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁱ : Fort Detrick, Frederick, MD 21701						
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Provide name if U.S. Academy Institution) NAME: Kulkarni, R.K. TELEPHONE: (301) 663-2332; AUTOVON 343-2332 SOCIAL SECURITY ACCOUNT NUMBER:						
23. GENERAL USE Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME: Meier, E.P. NAME: Rosencrance, A.B.		POC:DA				
24. KEYWORDS (Provide each with Security Classification Codes) (U) Waste Disposal; (U) Hazardous Wastes; (U) Chemical Fixation; (U) Heavy Metals								
25. TECHNICAL OBJECTIVE ^j ; 26. APPROACH; 27. PROGRESS (Provide individual paragraphs identified by number. Provide last of each with Security Classification Code.)								
23. (U) To evaluate the use of chemical fixation methods for the treatment and disposal of Army hazardous wastes. Sludges from Army electroplating and paint removal operations, excess laboratory chemicals, and excess inorganic pesticides are examples of Army hazardous wastes that require treatment to fix toxic inorganic components prior to disposal. The variety and composition of wastes generated are unique to Army operations and require evaluation on a case by case basis.								
24. (U) A problem definition study and a laboratory evaluation will be performed. The problem definition will (1) identify Army hazardous wastes that might be treated by chemical fixation; (2) review the literature and on-going R&D to determine what fixation methods are available; and, (3) develop an approach to aid in selecting the best fixation method for Army hazardous wastes as they are identified. The laboratory study will evaluate the success of the use of a chemical fixation process for treatment of sludge wastes of Tobyhanna Army Depot. Elutriate tests will be performed to determine if this treatment was effective in meeting state environmental standards for disposal of the fixed material in a sanitary landfill.								
25. (U) 7710 - 7809. An asphalt microencapsulation process for fixation by electroplating wastes was studied in detail and a technical report is in preparation.								

DETAIL SHEET

TITLE: Evaluation of Chemical Fixation Processes for Disposal of Army Hazardous Wastes

WORK UNIT NO: 125

AGENCY ACCESSION NO: DA OB 6229

PRINCIPAL INVESTIGATOR: Kulkarni, R.K.

BACKGROUND

The electroplating hazardous waste from Tobyhanna Army Depot, PA was used as a sample material in addition to synthetically made samples to evaluate and assess the different fixation methods already recognized in technology. The "Chem-Fix Cementation Process" and Asphalt Micro-encapsulation Process were chosen for the study. The attenuation of the leaching of heavy metal ions and cyanide by the fixing method, by using the Wisconsin leaching test, and standard analytical procedures for estimations, was undertaken.

PROGRESS

The Asphalt Micro-encapsulation Process of Werner & Pfleiderer Corp., known also as WPC-VRS Process, was studied in detail. This method of fixation was found to be efficient in attenuating the leaching of all soluble ions in synthetic and Tobyhanna Army Depot electroplating waste samples. Leachates generated from the fixed samples showed less than minimum allowable concentrations of cyanide and heavy metals. The only exceptions to this were zinc, copper and cadmium, whose concentrations in the leachates were slightly higher than minimum. The Tobyhanna Army Depot samples were not treated to eliminate cyanide and ammonia, (and hexavalent chromium) prior to fixation. This aspect of pretreatment is recommended as a basis of further study of the asphalt fixation. The data independently generated by USAEHA, on the "Chem-Fix Cementation Process," were not pertinent or useful to enable the comparison of the two processes.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	DA 0B 6230	78 10 01	DD-DR&E(AR)636
77 10 07	D. CHANGE	U	U	7. REGRADING*	8. DISSEM INSTRNM	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES*	PROGRAM ELEMENT	PROJECT NUMBER		11. TASK AREA NUMBER	12. WORK UNIT NUMBER	
A. PRIMARY	62720A	3E162720A835		00	127 APC F696	
B. CONTRIBUTING						
XXXXXX	CARDS 114F					
13. TITLE (PICK ONE WITH SECURITY CLASSIFICATION CODE)* (U) Evaluation of Filtration Techniques for Disposal of Operational Wastes from Army Pest Management Programs						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 003300 Chemical Engineering; 003400 Civil Engineering						
15. START DATE	16. ESTIMATED COMPLETION DATE	17. FUNDING AGENCY	18. PERFORMANCE METHOD			
7710	7909	DA	C. In-House			
19. CONTRACT/GANT		20. RESOURCES ESTIMATE				
A. DATES/EFFECTIVE:		B. PROFESSIONAL MAN YRS				
B. NUMBER*		C. FUNDS (in thousands)				
C. TYPE:		FISCAL YEAR	78	0.6	27	
D. AMOUNT:		CURRENT	79	1.0	63	
E. CUM. AMT.		21. PERFORMING ORGANIZATION				
22. RESPONSIBLE DOD ORGANIZATION		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL		NAME* Dennis, W.H. TELEPHONE (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER				
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		ASSOCIATE INVESTIGATORS NAME: Altman, R.G. NAME: POC:DA				
23. GENERAL USE		24. KEYWORD (PICK ONE WITH SECURITY CLASSIFICATION CODE) (U) Hazardous Wastes; (U) Filtration; (U) Pesticide Wastes; (U) Waste Treatment; (U) Water Treatment				
25. TECHNICAL OBJECTIVE* 26. APPROACH, 27. PROGRESS (PICK ONE WITH SECURITY CLASSIFICATION CODE)						
23. (U) To evaluate the use of filtration/adsorption techniques for treatment of wastes generated by Army installation pest control facilities. Stringent EPA pesticide regulations have led to the need for improved pest control facilities at Army installations with strict control on the disposal of the pesticide wastes generated. Federal law places responsibility for safe disposal on the user. The variety of pesticides used and the large volume of wastes generated make the requirement for this effort in pesticide waste treatment unique to DA.						
24. (U) A filtration/adsorption system will be assembled using commercially available or easily prepared filtration equipment. The system will include a pre-filter for removal of suspended solids and a charcoal filter for removal of pesticides and other organic contaminants. It will be tested against solutions of known pesticide concentrations and authentic wastes from Army pest control facilities. Aquatic bioassay before and after treatment will be used to determine the overall effectiveness of the system for removing toxic wastes. Analysis of the effluent water for selected pesticides will be used to determine if the system will produce water suitable for reuse at the facility or discharge into a sanitary sewer.						
25. (U) 7710 - 7809. The diatomaceous earth (DE) prefilter and the granular activated carbon (GAC) column filter were assembled. Tests with the DE prefilter indicate that it will acceptably reduce suspended solids and can reduce suspended pesticide concentrations (~ 1500 ppm) by approximately 90%. Preliminary tests indicate that GAC column treatment will reduce diazinon concentrations from 1500 ppm to less than 0.05 ppm. Isotherm data have been collected for diazinon adsorption on 10 carbons.						

DETAIL SHEET

TITLE: Evaluation of Filtration Techniques for Disposal of Operational Wastes from Pest Management Programs

WORK UNIT NO: 127

AGENCY ACCESSION NO: DA OB 6230

PRINCIPAL INVESTIGATOR: Dennis, W.H.

BACKGROUND

Current State and Federal¹ regulations have placed stringent restrictions on the use and disposal of pesticides and pesticide wastes. Many Army pest control facilities do not have the capability to meet these regulations and must be remodeled or new facilities must be built. Recognizing the health and environmental problems associated with pest control operations, TRADOC, US Army Training and Doctrine Command, has designed a pest control facility for Ft. Eustis, VA, that will meet all current and anticipated health and environmental regulations for such a facility. One unique feature of this design is that it has a common drainage system that collects all pesticide-containing wastewater from the facility and stores it for disposal by environmentally acceptable methods. As originally designed, the wastewater would be kept in storage tanks until a sufficient volume was collected for disposal by commercial waste disposal concerns. Federal law places ultimate responsibility for the fate of disposed wastes on the user. Thus, the Army's responsibility for these wastes does not end once they are taken off the installation. The Army must maintain stringent controls on the disposal of the hazardous wastes it generates. The volume and nature of the aqueous wastes generated by pest control operations and past examples of improper disposal of hazardous wastes by commercial operators demonstrate the need for a better system for treatment and disposal of the wastes from Army pest control facilities.

TRADOC recognized this problem in abatement and requested that USAMBRDL review the environmental requirements for pesticide disposal and develop and evaluate a treatment system for aqueous wastes from the newly designed facility.² One approach that appears feasible for pesticide waste treatment is the use of a filtration/adsorption system based on diatomaceous earth prefiltration and carbon adsorption.

PROGRESS

Isotherm data has been obtained for the adsorption of diazinon on 10 different carbons (Table 1). The isotherms were obtained with an initial diazinon concentration of approximately 1500 mg/l. A typical isotherm is shown in Figure 1. It is important to note that these isotherms cover a large concentration range. The linear relationship between carbon weight and diazinon concentration (at the lower carbon weights) may indicate that at high diazinon concentrations the suspended material is coalescing on the carbon particles. Once the diazinon concentration is reduced below the solubility of diazinon, the isotherm becomes non-linear and obeys Langmuir behavior. This may indicate that the coalesced material forms a thin film around the carbon particles to produce a uniform surface. The adsorption phenomenon then becomes one of extraction into the hydrocarbon film and adsorption onto the carbon surface. This would explain the Langmuir behavior at lower diazinon concentrations. The results show that all of the carbons tested can reduce the diazinon concentration to less than 0.05 mg/l when excess carbon is available. Based on the isotherm data and recommendations from EPA, Edison, NJ, Calgon F300 was selected for use in operational tests of the carbon column section of the filtration system. This carbon was selected because of its high adsorption capacity for diazinon and its reliable commercial availability. Isotherm data is being collected for the adsorption of chlordane on the more promising carbons.

Initial results with a single carbon column (5" diameter x 6' length) at a low loading rate ($\sim 0.7 \text{ gal/min/ft}^2$) indicate that the carbon will effectively remove diazinon from aqueous solutions containing high concentrations of the emulsifiable concentrate ($\sim 1500 \text{ mg/l}$). No diazinon was detectable (detection limit $\sim 30 \mu\text{g/l}$) in the effluent water even after 10 bed volumes of pesticide solution had passed through the column. These results are encouraging and indicate that the column system will be successful in removing diazinon from aqueous wastes.

The diatomaceous earth (DE) prefilter was assembled from a Hayward Perflex EC65 swimming pool filter. Early test results indicate that the DE prefilter will reduce the suspended solids to a level acceptable for use with the carbon columns. Test results show that suspended solids concentrations of 200-300 ppm can be reduced to less than 10 ppm.

TABLE 1. ACTIVATED CARBONS EVALUATED FOR USE IN FILTRATION
OF AQUEOUS PESTICIDE WASTES

Source	Carbon
Westvaco Chemical Sales Division Covington, VA 24426	Nuchar WV-G,* 12 x 40 mesh Nuchar S-A Nuchar WV-W,* 8 x 30 mesh Nuchar Aqua
ICI America Inc. Wilmington, DE 19899	DARCO HD 3000, 325 mesh, DXL-0-6431 DARCO HD 3000, large mesh
Barnebey Cheney Columbus, OH 43219	PC* 1333 NW 8728
North American Carbon Inc. Box 19737 Columbus, OH 43219	P 100, lot 2022, 21 Dec 77
Calgon Corp.	Filtrasorb, F-300, pulverized, PXX Filtrasorb, F-300, large mesh
Witco Chemical Corp. 277 Park Ave. New York, NY 10017	Witcarb TM *, Grade 950, 12 x 30 mesh

* Samples ground to 325 mesh for isotherm studies

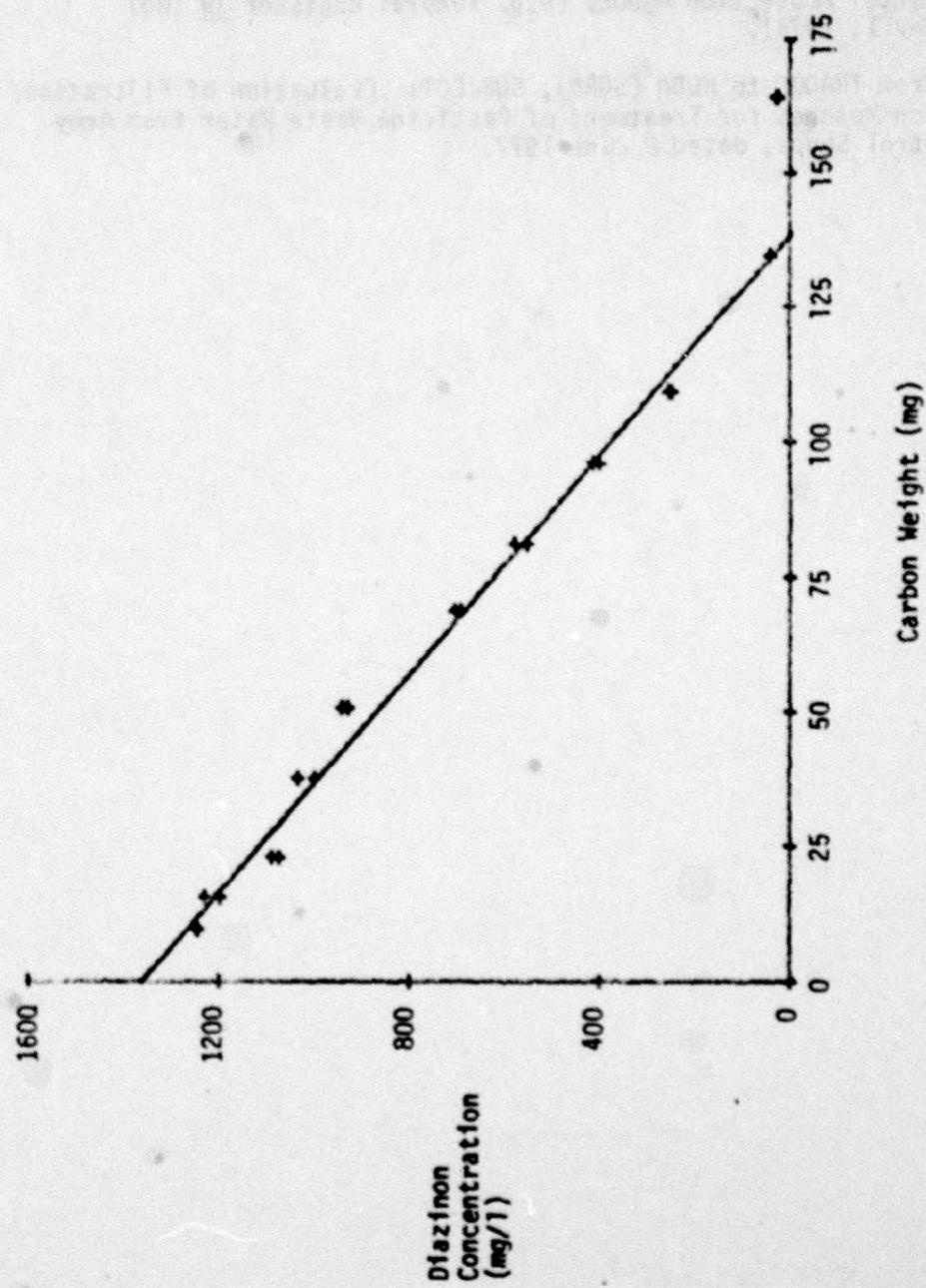


Figure 1. Adsorption Isotherm - Diazinon on Calgon F300

REFERENCES

1. Federal Environmental Pesticide Control Act of 1972, Public Law 92-516, 86 Stat. 973 and subsequent regulations issued by the Environmental Protection Agency (e.g. Federal Register 39 (85) 15236, May 1, 1974).
2. Letter from TRADOC to HQDA (SGRD), SUBJECT: Evaluation of Filtration/Adsorption Methods for Treatment of Pesticide Waste Water from Army Pest Control Shops, dated 8 June 1977.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ¹	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY ³	6. WORK SECURITY ⁴	DA OB 6182	78 10 01	DD-DR&E(AK)636
77 10 01	D. CHANGE	U	U	NA	NL	7. REGRADING ⁵ <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
10. ID. NO./CODES ⁶	PROGRAM ELEMENT	PROJECT NUMBER		8. TASK AREA NUMBER	9. WORK UNIT NUMBER	
A. PRIMARY	62720A	3E162720A835		00	128 APC F688	
B. CONTRIBUTING						
C. X8M2RMRX	CARDS 114f					
11. TITLE (Proceed with Security Classification Code) ⁷ (U) Evaluation of Unit Processes for Development of Army Reuse Standards and Criteria						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁸ 003300 Chemical Engineering; 003400 Civil Engineering; 004200 Computers; 007800 Hygiene and Sanitation						
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD		
7404	CONT		DA	C. In-House		
17. CONTRACT/GRAANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (in thousands)
A. DATES/EFFECTIVE:	EXPIRATION:		FISCAL YEAR	PREVIOUS 78	2.3	90
B. NUMBER:			CURRENT	79	1.1	46
C. TYPE:	D. AMOUNT:		E. CUM. AMT.	21. PERFORMING ORGANIZATION		
22. RESPONSIBLE DOD ORGANIZATION				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUAL				NAME: Peterman, B.W. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER:		
23. GENERAL USE				ASSOCIATE INVESTIGATORS NAME: Cowen, W.F. NAME:		
POC:DA						
24. KEYWORD (Proceed with Security Classification Code) (U) Drinking Water; (U) Wastewater Treatment; (U) Wastewater Reuse; (U) Water Quality; (U) Water Analysis; (U) Ozonation; (U) Reverse Osmosis						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Proceed rest of each with Security Classification Code.)						
23. (U) Define and characterize unit processes for a treatment system to provide (a) treatment for discharge or (b) non-consumptive reuse of certain wastewaters generated in a field environment.						
24. (U) Various unit processes to include microfiltration, ultrafiltration, reverse osmosis, carbon adsorption and ozone oxidation will be evaluated to determine the level of treatment that must be provided for direct reuse of selected wastewaters. Currently shower and laundry wastes are scheduled for evaluation; however, as other wastewaters are identified as having reuse potential, they will be included in the unit process evaluations.						
25. (U) 7710 - 7800. A study of the treatability of unique medical wastes was completed. The wastes, from an operating room and a chemical laboratory were treated with membrane ultrafiltration, reverse osmosis as well as ozone oxidation to determine the level of treatment required for discharge to the environment. A study to determine the chemical character of the product water following treatment of shower waste with membrane microfiltration, ultrafiltration and reverse osmosis was contracted and is continuing.						

DETAIL SHEET

TITLE: Evaluation of Unit Processes for Development of Army Reuse Standards and Criteria

WORK UNIT NO: 128

AGENCY ACCESSION NO: DA OB 6182

PRINCIPAL INVESTIGATOR: Peterman B.W.

BACKGROUND

The reuse of wastewater has been proposed as a technique for the reduction of potable water needs in the field and at fixed installations. The application of reuse concepts to Army activities would also serve as a means of conserving water in areas where supplies are scarce or contaminated to such an extent that purification is not economical. This work unit is directed at determining the unit processes that are available to be used in reuse systems. Products from selected unit processes are being studied to assess their quality so treatment technology might be an integral part of establishing criteria and standards for non-potable and potable reuse.

PROGRESS

Pilot plant evaluation of the treatability of unique medical wastewaters from operating rooms and clinical laboratories was completed. The recognized potential reuse by other than medical elements of the Army generated a need for assessing the chemical character of the product water that would be produced by unit processes which might be used for reuse. Work was started, during the 4th Quarter FY78, to provide a characterization of shower wastewater following treatment with tubular membrane micro-filtration, ultrafiltration, and reverse osmosis. The information garnered from this, and subsequent studies of other wastewaters selected for reuse, will be available to design engineers as well as those who recommend criteria for the non-potable short and long-term reuse of wastewaters.

REFERENCES

Reuter, L.H. and J.C. Eaton, Jr., "Developing Water Quality Criteria for the Field Army." Presentation to the National Drinking Water Advisory Council, Dallas, TX, 23 May 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁵ DA OB 6937	2. DATE OF SUMMARY ⁶ 78 10 01	REPORT CONTROL SYMBOL DD-DRAE(AR)636
5. DATE PREV. SURVEY 77 10 01	6. KIND OF SUMMARY D. CHANGE	7. SUMMARY ACTIV. U	8. WORK SECURITY U	9. REBRADING ⁷ NA	10. DISPN INSTN. NL	11. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
12. NO./CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY B. CONTRIBUTING	62720A	3E162720A835		00	130 APC F630	
C. WORK UNIT NUMBER	CARDS 114f					
13. TITLE (Prefix each with security classification code) (U) Chemical Characterization of Waters and Wastewaters for Development of Army Standards and Criteria						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 003400 Civil Engineering						
15. START DATE 7311	16. ESTIMATED COMPLETION DATE CONT	17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House			
19. CONTRACT/GANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN HRS		
A. DATES/EFFECTIVE: EXPIRATION:		FISCAL YEAR	PRECEDING	1.8		79
B. NUMBER: C. TYPE: D. KIND OF AWARD:		CURRENT	79	2.0		89
E. CUM. AMT.		22. PERFORMING ORGANIZATION				
23. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
24. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Prefix each with security classification code) NAME: Cowen, W.F. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: NAME: Cooper, W.J. NAME: POC:DA				
25. GENERAL USE Foreign Intelligence Not Applicable						
26. KEYWORDS (Prefix each with security classification code) (U) Sanitary Engineering; (U) Recycle; (U) Wastewater Treatment; (U) Water Quality; (U) Water Analysis						
27. TECHNICAL OBJECTIVE ⁹ ; 28. APPROACH; 29. PROGRESS (Prefix each individual paragraph identified by number with security classification code)						
23. (U) To provide water analyses in support of contracts and in-house research on the development of standards and criteria for water treatment, wastewater reuse and treatment by field Army units.						
24. (U) Use automated colorimetric methods for analysis of common water quality parameters. Develop in-house capability for measuring trace concentrations of organics in waters by fluorimetric and gas chromatographic methods.						
25. (U) 7710 - 7809. Support of laundry/shower water reuse efforts has required initiation of methods for synthetic detergents. The methylene blue method extraction for anionic and bromphenol blue extraction method for cationic detergents appear to work well. Base-neutral and acid extractions into methylene chloride will be used to obtain extracts for organic compound screening by gas chromatography.						

DETAIL SHEET

TITLE: Chemical Characterization of Waters and Wastewaters for Development of Army Standards and Criteria

WORK UNIT NO: 130

AGENCY ACCESSION NO: DA OB 6937

PRINCIPAL INVESTIGATOR: Cowen, W.F.

BACKGROUND

To reduce the water supply requirement by Army installations, the Army has begun to investigate the opportunities for reuse of selected wastewaters for non-potable applications.¹ Two of the candidate wastewaters are shower and laundry waters. An important requirement in the development of wastewater treatment processes will be the characterization of the treated waters for organic and inorganic compounds of health and environmental significance. In addition, chemical support is required for the pilot scale wastewater treatment studies (Work Unit 688), to furnish process data (routine parameters such as suspended solids, total organic carbon, and chemical oxygen demand) to the pilot plant investigators. This work unit has been established to furnish such support and to develop methods of analysis whenever necessary.

PROGRESS

A report detailing procedures for analysis of certain ozonation end products (glyoxal, methyl glyoxal, dimethyl glyoxal, glyoxylic acid, formaldehyde, and carboxylic acids) is still in progress.

Methods for analysis of anionic and cationic surfactants have been applied to treated shower wastewater to supplement total organic carbon and chemical oxygen demand as chemical parameters to assess the efficiency of treatment. Solvent extraction techniques are now in progress to obtain gas chromatographic analyses of compounds which may build up in wastewater which has been recycled through the waste treatment several times.

REFERENCE

1. Reuter, L.H. and J.C. Eaton, Jr., "Water Reuse: Developing Water Quality Criteria for the Field Army," Presentation to the National Drinking Water Advisory Council, Dallas, TX, 23 May 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL	
4. DATE PREV SUMMARY 77 10 01	5. KIND OF SUMMARY D. CHANGE	6. SUMMARY SCY ⁴ U	7. WORK SECURITY ⁵ U	8. REGRADING ⁶ NA	9. DA DISBN INSTRN ⁷ NL	10. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	11. LEVEL OF SUM. WORK UNIT A. WORK UNIT
12. NO. /CODES ⁸ PROGRAM ELEMENT		PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY 62720A		3E162720A835		00		133 APC F633	
B. CONTRIBUTING XXXXXXRXX		CARDS 114f					
13. TITLE (Printed with Security Classification Code) (U) Development of Improved Field Test Procedures for Determining Chemical Disinfection Residuals in Aqueous Solutions							
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 008700 Laboratories, Test Facilities and Test Equipment							
15. START DATE 7205		16. ESTIMATED COMPLETION DATE 7909		17. FUNDING AGENCY DA		18. PERFORMANCE METHOD C. In-House	
19. CONTRACT/GANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN YRS		22. FUNDS (In thousands)	
A. DATES/EFFECTIVE:		EXPIRATION		FISCAL YEAR	PREDICTED	CURRENT	35
B. NUMBER: C. TYPE:		D. AMOUNT:		78	0.8	42	
E. KIND OF AWARD:		F. CUM. AMT.		79	0.8		
23. RESPONSIBLE DOD ORGANIZATION		24. PERFORMING ORGANIZATION		25. PRINCIPAL INVESTIGATOR (Print in full if U.S. Army or its contractor) NAME: Cooper, W.J. TELEPHONE: (301) 663-7207; AUTOVON 343-7207			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Wade, C.W.R. NAME: POC:DA			
26. KEYWORD (Print each with Security Classification Code) (U) Analysis; (U) Syringaldazine; (U) Chlorine Dioxide; (U) Bromine; (U) Chlorine; (U) Iodine; (U) Combined Chlorine; (U) Test Kit							
27. TECHNICAL OBJECTIVE, 28. APPROACH, 29. PROGRESS (Print in individual paragraphs identified by number. Print last of each with Security Classification Code.)							
23. (U) To modify the FACTS procedures for use in determination of combined available chlorine, ozone, bromine and chlorine dioxide; and to assist USAMERADCOM in the product improvement program for the Army FACTS field test kit for free available chlorine (FAC). The need for an improved test for FAC is uniquely military since military water supplies vary much more widely than civilian water supplies, resulting in a wider spectrum of interferences and a wider range of required chlorine dosages; military equipment must be capable of operating over a wider range of conditions than civilian equipment; and military tests must be simple enough to require a minimum of operator training. Ozone, bromine and chlorine dioxide are potential alternatives to chlorine for use in disinfection of military water supplies. Ozone oxidation is being considered as a unit process for the treatment of medically unique wastes from Army Field Hospitals.							
24. (U) The FACTS Procedure will be tested for its ability to determine ozone, combined chlorine, bromine, and chlorine dioxide in water. The stoichiometry of the color reactions will be determined and FACTS procedures will be developed for these compounds.							
25. (U) 7710 - 7809. Modifications of the FACTS procedure were developed for the analysis of bromine and iodine. Development of a commercially available FACTS kit was coordinated with Ames Laboratories, Elkhart, IN. The FACTS (Ames) indicator was tested and shown to have acceptable sensitivity to free available chlorine.							

DETAIL SHEET

TITLE: Development of Improved Field Test Procedures for Determining Chemical Disinfection Residuals in Aqueous Solutions

WORK UNIT NO: 133

AGENCY ACCESSION NO: DA OA 6943

PRINCIPAL INVESTIGATOR: Cooper, W.J.

BACKGROUND

The old Army standard Modified Orthotolidine Arsenite Method (MOTA) for determining free available chlorine (FAC) in drinking water and wastewater gave erroneous results in the presence of nitrite, combined chlorine and manganic and ferric compounds. Recognizing this deficiency the Army funded a contract effort¹ to develop an improved field method for measuring FAC. This contract effort resulted in the Stabilized Neutral Orthotolidine Test (SNORT). However, in a review of the data obtained with the SNORT procedure, an ad hoc committee of the Armed Forces Epidemiological Board² concluded that the false positive response of this method to combined chlorine was unacceptable. The committee recommended that SNORT not be adopted as an Army method.

The USAMBRDL has evaluated commercial field test kits for determining free chlorine residuals in aqueous solutions.³⁻⁵ The objective of these studies was to determine if any existing field test kit was more accurate and reliable than the MOTA method for determining FAC. The results of these studies demonstrated that none of the kits tested was significantly superior to the MOTA method. However, three test procedures; DPD (*N,N*-diethyl-p-phenylenediamine), SNORT (liquid) and Syringaldazine (liquid), performed better than the others tested.

Modifications to these three procedures were made and evaluated in an attempt to develop a procedure improved to the required degree.⁶ The DPD procedure could be modified to reduce, but not eliminate, interference from monochloramine. The SNORT procedure could be modified to eliminate interference from monochloramine, but not from oxidized forms of manganese.

A modification of the Syringaldazine (liquid) procedure, FACTS (Free Available Chlorine Test using Syringaldazine), was demonstrated to have the required range, specificity, accuracy and precision for an Army field

kit.^{6,7} This procedure has been successfully incorporated into a prototype version of the Army field test kit. A product improvement program (PIP) was scheduled for FY77 by the US Army Mobility Equipment Research and Development Command (USAMERADCOM) to modify the current Army kit to use the FACTS procedure.

However, due to lack of funding the PIP has not been undertaken. Since the FACTS method is not commercially available, the Army is currently using locally purchased DPD test kits for FAC analysis.

Under another contract effort,⁸ the Army has developed a membrane electrode for FAC analysis. This electrode promises to be a specific method for analysis for the active disinfectant fraction of FAC. However, more testing is required to fully evaluate its acceptability for Army use.

The use of chlorine as a disinfectant in water treatment has been questioned recently because of the potential formation of carcinogenic chlorinated hydrocarbons during the treatment process. As a result, other methods of disinfection are being considered for water treatment. These alternatives may use ozone, bromine, or chlorine dioxide. Bromine is currently used by the Navy for shipboard water treatment in its submarine fleet. The Army is considering the use of ozone to treat reclaimed wastewater in the MUST water processing element currently under development. USEPA is looking into the use of chlorine dioxide as an alternative disinfectant in water treatment.

The FACTS procedure is the most specific colorimetric method for free available chlorine. It is a new procedure and has not been tested to determine its value as an analytical method for other disinfectants such as ozone, bromine, or chlorine dioxide. In addition, its ability to determine combined chlorine, an analysis of interest to sewage treatment operators, has not been fully developed. Since there is a strong probability that FACTS will be accepted as the Army method for FAC analysis, the capability of using this method for analysis of other disinfectants and combined chlorine will be evaluated.

PROGRESS

The FACTS procedure has been modified for the analysis of chloramines, iodine, bromine, chlorine dioxide and ozone. The FACTS methods for combined chlorine and ozone are available in the final report, "Development of FACTS Procedures for Combined Chlorine and Ozone in Aqueous Solutions," (dated March 1977) from Grant No. DAMD 17-77-6-9436. A report on the methods for iodine, bromine and chlorine dioxide is being drafted.

Past experience has shown that the indicator response varies with the quality of the solvent. Several methods for improving the quality of the FACTS indicator solvent, 2-propanol, were evaluated. Treatment with basic or acidic alumina actually reduced the quality of the solvent. Treatment with activated coconut carbon improved the quality of the solvent; however, distillation from acid gave the best results (see Figure 1). The 2-propanol was distilled from a solution of 10 ml of glacial acetic acid per liter of 2-propanol. Distillation produced a solvent that gave good reproducible indicator solutions. However, the test method still produces more color if KI is added prior to FAC. This indicates that a small concentration of a combined form of chlorine is produced by the HOCl-solvent reaction. The chemistry of the HOCl-FACTS indicator reaction is being investigated in more detail in an attempt to identify the source of the interfering reaction.

The Ames Company is planning to market a test kit based on the FACTS procedure. This is important because it establishes commercial availability of the FACTS method and will make it available for use by the water treatment community. Such availability should generate acceptance by the scientific community and make it easier to gain support for a standard Army FACTS test kit. The Ames system was evaluated and compared to the USAMBRDL FACTS method (Figure 2). The test results indicate that the Ames FACTS system is acceptable. However, the addition of the AOT (aerosol-OT) surfactant does not appear to be necessary as an indicator component.

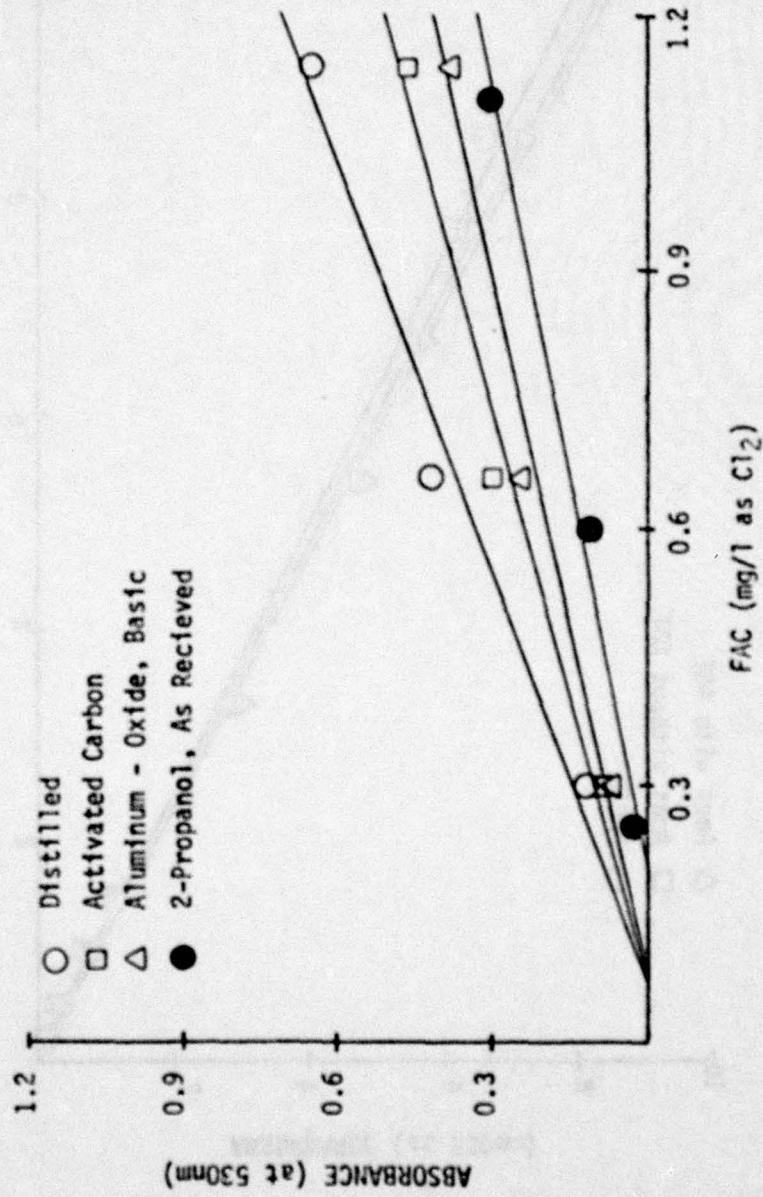


Figure 1. Solvent Treatment Systems.

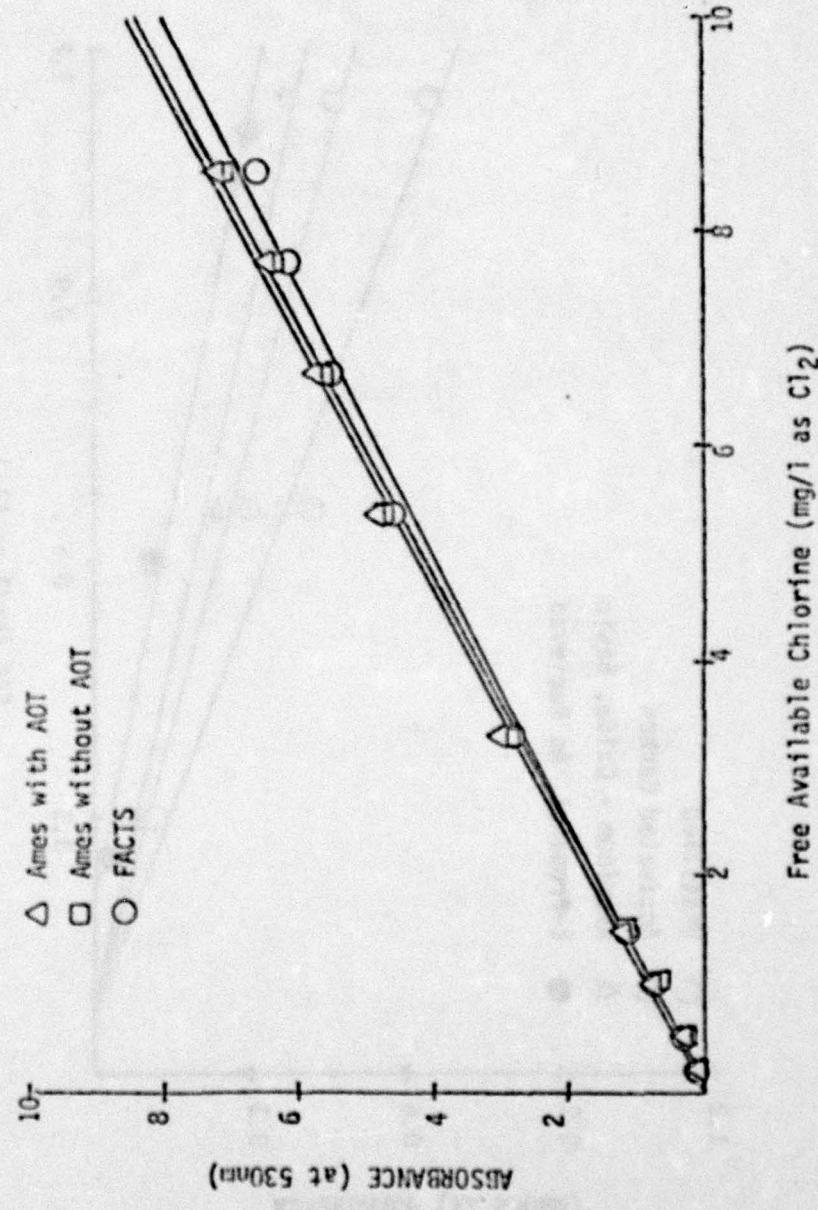


FIGURE 2. Beer's Law Plots for FACTS and Ames Data.

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2. "Recommendation on Field Methods for Testing Free Chlorine Residuals in Potable Water," Memorandum, The Surgeon General, Department of the Army, Armed Forces Epidemiological Board (28 May 1971).
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8. Goldring, Lionel, "Development of a Free Chlorine Residual Electrode," Orion Research, Inc., DAMD 17-77-C-7049.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY	6. WORK SECURITY	DA DA 6945	78 10 01	DD-DRA&E(AR)636	
77 10 01	D. CHANGE	U	U	NA	NL	8. SPECIFIC DATA - CONTRACTOR ACCESS	9. LEVEL OF SUM A. WORK UNIT
10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
11. PRIMARY	62720A	3E162720A835		00		135 APC F635	
12. CONTRIBUTING							
13. CARDS XXXXXXXX	CARDS 114f						
14. TITLE (Print in full with security classification code) (U) Development and Evaluation of Methods for the Chemical Disposal of Military Standard Pesticides							
15. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 012100 Organic Chemistry; 003300 Chemical Engineering							
16. START DATE 7205	17. ESTIMATED COMPLETION DATE CONT	18. FUNDING AGENCY DA	19. PERFORMANCE METHOD In-House				
20. CONTRACT/GANT		21. RESOURCES ESTIMATE	22. PROFESSIONAL MAN-YRS	23. FUNDS ON REQUEST			
24. DATES/EFFECTIVE		FISCAL YEAR	78	1.8	119		
25. NUMBER		TURRNTY	79	3.5	161		
26. TYPE		27. AMOUNT					
28. KIND OF AWARD		29. CUM. AMT.					
30. RESPONSIBLE DOD ORGANIZATION		31. PERFORMED ORGANIZATION					
NAME* US Army Medical Bioengineering Research & Development Laboratory		NAME* US Army Medical Bioengineering Research & Development Laboratory					
ADDRESS* Fort Detrick, Frederick, MD 21701		ADDRESS* Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR/POWER BEAR IF U.S. ACADEMIC INSTITUTION					
NAME Dettor, C.M., COL		NAME Dennis, W.H.					
TELEPHONE (301) 663-2434; AUTOVON 343-2434		TELEPHONE (301) 663-2036; AUTOVON 343-2036					
32. KEYWORD (Print in full with security classification code) (U) Pesticides; (U) Solid Waste; (U) Ultimate Disposal; (U) Pesticide Wastes; (U) Pesticide Chemistry		SOCIAL SECURITY ACCOUNT NUMBER					
33. TECHNICAL OBJECTIVE, 34. APPROACH, 35. PROGRESS (Print in individual paragraphs identified by number. Print in full with security classification code)							
23. (U) To develop chemical methods for the detoxification of military standard organophosphorus and carbamate pesticide formulations and to evaluate the practicality and health and environmental effects of disposal of the detoxified material. The magnitude of the pest management program conducted annually by DA and the large stock of pesticide wastes generated by this program make the requirement for this effort in pesticide disposal unique to DA. Federal Law places responsibility for safe disposal on the User -- DA.							
24. (U) Laboratory studies will be conducted to develop chemical methods for complete degradation of the pesticide in each formulation. Health and environmental effects of disposal of the resulting reaction mixtures will be evaluated using data from the literature for known or suspected toxicity of the reaction products to mammals and aquatic biota and by conducting aquatic bioassays on the reaction mixtures and isolated reaction products.							
25. (U) 7710 - 7809. Papers on the Clorox ^R degradation of diazinon and on the identification of sulfotep as a toxic impurity in diazinon were submitted for publication in the open literature. Studies have shown that pure malathion may be detoxified by Clorox ^R treatment; however, the emulsifiable concentrate is not acceptably detoxified. Aquatic toxicity studies indicated that solutions containing both the heavy aromatic naphtha constituent of the pesticide emulsifiable concentrates and Triton X surfactants are toxic to bluegill.							
45							
*Available to contractors upon author's approval							
DD FORM 1 MAR 68 1498 PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 68 AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.							
* U.S. GPO: 1974-540-843/8691							

DETAIL SHEET

TITLE: Development and Evaluation of Methods for the Chemical Disposal of Military Standard Pesticides

WORK UNIT NO: 135

AGENCY ACCESSION NO: DA OA 6945

PRINCIPAL INVESTIGATOR: Dennis, W.H.

BACKGROUND

Section 19(a) of the Federal Environmental Pesticide Control Act of 1972 (FEPCA)¹ authorized the Administrator of the US Environmental Protection Agency (USEPA) to establish procedures and regulations for the storage and disposal of pesticides and pesticide containers. With this authority, USEPA published regulations^{2,3} for the acceptance of pesticides for disposal by USEPA and procedures for the storage and disposal of pesticides by the owner.

The only pesticides accepted for disposal by USEPA are those whose registrations have been cancelled following suspension to prevent an imminent hazard, as specified in Section 6(c) of the FEPCA. Since no Department of the Army (DA) surplus pesticides or pesticide wastes fall under this category, the storage and disposal of these materials remains the responsibility of DA (the owner).

USEPA-recommended procedures for disposal of pesticide wastes^{2,3} include incineration; burial in a designated landfill; soil injection; chemical degradation; and temporary storage. Because of a lack of information on the proper application of these procedures and a lack of disposal sites, USEPA has not published specific criteria or methods for implementing these procedures. USEPA has prohibited³ open dumping; open burning; water or ocean dumping; storage so as to contaminate food and feed supplies; and well injection (except under specific conditions) as methods for pesticide disposal. Because of the lack of information available and the variables involved, USEPA recommends that advice be requested from a Regional Administrator before undertaking soil injection or chemical degradation as methods of disposal. The responsibility for demonstrating that a proposed disposal procedure is environmentally safe continues to rest with DA (the owner).

AR 200-1⁴ gives the Surgeon General the responsibility to develop environmental data, establish criteria, and recommend standards for safe disposal of hazardous and toxic materials used or generated by DA. This responsibility can only be achieved by active research to develop and evaluate methods for disposal of these wastes.

Pesticide wastes generated within DA come from two sources: large surplus stockpiles of pesticides (primarily organochlorine) held in temporary storage pending development of methods for large-scale destruction; and pesticide wastes (primarily organophosphate and carbamate) generated by on-going pest management programs. The disposal of surplus stockpiles by incineration is being addressed by the Defense Supply Agency (DSA). This effort has been supported through a US Army Medical Research and Development Command (USAMRDC) study⁵ for the safe incineration of all military standard organochlorine pesticide formulations. Presently, incineration is not a practical means for disposal of the pesticide wastes generated by on-going pest management programs.

Disposal guidance contained in existing DA publications^{6,7} is no longer valid, and in some cases no longer legal. One of these publications (AR 420-76) has been under review for some time, but has not been published in revised form; the delay being caused in part by the absence of a data base for recommending disposal methods.

The US Army Health Services Command⁸ (HSC) provided interim guidelines for the repackaging of liquid pesticides and disposition of empty containers, and the physical decontamination of containers by triple rinsing or draining as completely as possible prior to burial in a landfill or return to manufacturers or drum reclamation agencies. These guidelines were required to manage the large quantities of pesticides (primarily organochlorine) being held in temporary storage pending development of procedures for their large-scale disposal; and to manage the disposal of containers and other pesticide wastes (primarily organophosphate and carbamate) generated by on-going pest management programs. The matter of managing operational pesticide wastes is critical because the number of alternatives for disposition is diminishing; and new methods of disposal cannot be used without sufficient technical information on health and environmental impact.

The DA conducts a pest management program of substantial magnitude and large pesticide inventories are required to support this program. The responsibility for proper disposal of operational wastes of all types, makes this problem unique to DA. One disposal method that has considerable potential for the handling of operational wastes is chemical treatment. The USEPA continues to recognize that there are certain chemical methods for the destruction of pesticides. However, such methods are

not available for all types of pesticides, and where methods are available, sufficient data do not exist to demonstrate that they can be used without adverse effects on health and the environment.⁹ USEPA continues to recommend that chemical disposal of pesticides be undertaken only with the advice of a Regional Administrator.

Research on the health effects of the chemical disposal of pesticides was initiated (FY73) on the basis of problem definition studies,^{9,10} coordination with various federal agencies, and review and concurrence by a National Academy of Sciences Advisory Subcommittee on Pesticide Disposal. This research effort is studying only currently-used military standard formulations of organo-phosphate and carbamate pesticides, and has identified a number of chemical treatment systems¹¹ (i.e., chemical reagents; reaction kinetics and products; toxicity to aquatic biota) for several of these formulations.

PROGRESS

Two reports concerning the discovery of a toxic impurity, sulfotepp, in diazinon formulations and the degradation of diazinon by sodium hypochlorite have been submitted for publication.^{13,14} It was found that although acid hydrolysis¹² of diazinon formulations is not effective in degrading sulfotepp, treatment of diazinon formulations with sodium hypochlorite will degrade sulfotepp. The complete sequence of reactions leading to diazinon degradation by hypochlorite is shown in Figure 1.

The presence of sulfotepp in diazinon formulations appears to arise during its synthesis. The probable mode of sulfotepp formation is shown in Figure 2. These studies were presented before the Middle Atlantic Regional Meeting of the American Chemical Society.

The rate of degradation of dursban by hypochlorite was determined between pH 13.2 and 5.3 and was found to be most rapidly degraded at pH 9.0 and most slowly degraded at pH 5.3. Below pH 9.9 oxydursban was found in some reaction mixtures. This compound was found to be 13 times more toxic to daphnia than dursban. The degradation of dursban by hypochlorite appears similar to the degradation of diazinon in that the first step in both reactions is the oxidation of the P=S bond to a P=O bond and that trichloroacetic acid is a final product common to both reactions.

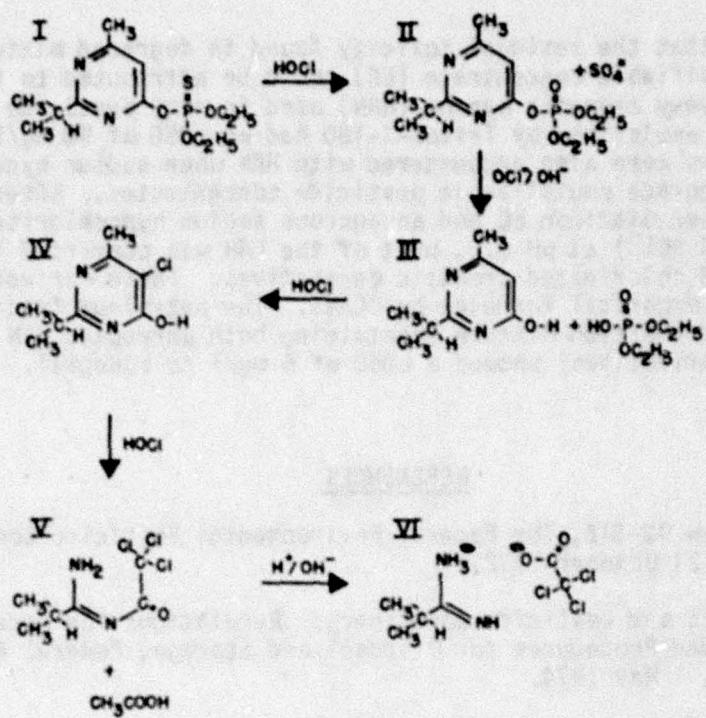


Figure 1. Degradation of Diazinon by $\text{HOCl}/\text{OC}1^-$.

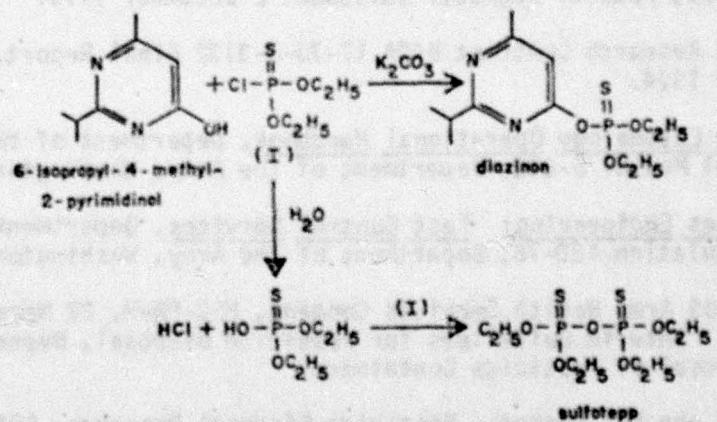


Figure 2. Potential Path Leading to Sulfotep During Diazinon Synthesis.

It was found that the residual toxicity found in degraded mixtures of diazinon emulsifiable concentrate (EC) could be attributed to the petroleum derivative, heavy aromatic naphtha (HAN) used in many pesticide formulations. The HAN, when emulsified by Triton-X-180 had an LD₅₀ of 50 mg/l for bluegill. Problems were also encountered with HAN when sodium hypochlorite was used to degrade emulsifiable pesticide concentrates. After a 48 hour reaction between diazinon EC and an aqueous sodium hypochlorite (400 mg/l HAN and 0.15 N NaCl) at pH 8.3, part of the HAN was converted to a mixture of at least 18 chlorinated aromatic derivatives. These derivatives were classified by empirical formulae by GC/MS. The petroleum fraction isolated from the reaction mixture (containing both unreacted HAN and the chlorinated derivatives) showed a LD₅₀ of 5 mg/l to bluegill.

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4. AR 200-1, Environmental Protection and Enhancement, Peacetime Responsibilities, Federal Register 40:55962, 2 December 1975.
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9. State of the Art Report: Pesticide Disposal Research, EPA-60012-78-183, September 1978.
10. "Problem Definition Study: Evaluation of Health and Hygiene Effects of the Disposal of Pesticides and Pesticide Containers," USAMEERU Report No. 73-01, Aberdeen Proving Ground, MD, August 1972.

11. "Methods of Chemical Degradation of Pesticides and Herbicides - A Review," USAMEERU Report No. 73-04, Aberdeen Proving Ground, MD October 1972.
12. Chemical Degradation of Military Standard Formulations of Organophosphorus and Carbamate Pesticides. I. Chemical Hydrolysis of Diazinon, USAMBRDL Technical Report 7611, November 1976.
13. Sulfotepp, A Toxic Impurity in Pesticide Formulations of Diazinon, submitted to Science, July 1978.
14. Degradation of Diazinon by Sodium Hypochlorite; Chemistry and Aquatic Toxicity, submitted to J. Agr. Food Chem., July 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
3. DATE PREV SURVEY	4. KIND OF SUMMARY	5. SUMMARY SCTY ³	6. WORK SECURITY ³	DA OA 6947	78 10 01	DD-DR&E(AR)636
77 10 01	D. CHANGE	U	U	NA	NL	7. REGARDING ⁴
10. NO./CODES ⁵		PROGRAM ELEMENT	PROJECT NUMBER	8A. DISSEM INSTRN	9. SPECIFIC DATA-CONTRACTOR ACCESS	9. LEVEL OF SUM
a. PRIMARY		62720A	3E162720A835	00	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
b. CONTRIBUTING						
XXXXXXXXXX		CARDS 114F				
11. TITLE (Provide with Security Classification Code) ⁶ (U) Development and Evaluation of Criteria for Advanced Wastewater Treatment Processes at Military Installations						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁷ 003300 Chemical Engineering; 003400 Civil Engineering						
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD	
7205		CONT		DA	C. In-House	
17. CONTRACT/GANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (in thousands)
a. DATES/EFFECTIVE:				PRECEDING	2.8	96
b. NUMBER:				FISCAL YEAR	78	
c. TYPE:				CURRENT	3.5	143
d. KIND OF AWARD:				79		
e. CUM. AMT.						
21. RESPONSIBLE DOD ORGANIZATION				22. PERFORMING ORGANIZATION		
NAME ⁸ : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁸ : Fort Detrick, Frederick, MD 21701				NAME ⁸ : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁸ : Fort Detrick, Frederick, MD 21701		
23. RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Printed Name // U.S. Academy Institution)		
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				NAME: Miller, R.D. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER:		
24. GENERAL USE				ASSOCIATE INVESTIGATORS		
Foreign Intelligence Not Applicable				NAME: Bartgis, K.A. POC:DA		
25. KEYWORDS (Print each with Security Classification Code) (U) Sanitary Engineering; (U) Nutrient Removal; (U) Wastewater Treatment; (U) Pollution Abatement						
26. TECHNICAL OBJECTIVE, ⁹ 28. APPROACH, 29. PROGRESS (Print individual paragraphs identified by number. Provide text of each with Security Classification Code.)						
23. (U) Provide Advanced Wastewater Treatment (AWT) technology applicable to US Army wastewater treatment plants so that NPDES permit limitations under PL 92-500 can be met. Design criteria will be established for selected processes with initial emphasis on phosphorus and nitrogen removal procedures. Nutrient removal studies for biological systems have been directed primarily toward the activated sludge system. Most Army wastewater treatment plants are trickling filters; therefore, nutrient removal research will be oriented primarily toward trickling filter systems. In addition, selected Army industrial waste discharges will be evaluated to ascertain both (1) the removal of pollutants from the wastewater, and (2) the effect of those pollutants on the operation of the wastewater treatment plant.						
24. (U) Pilot scale studies will be conducted on selected AWT processes and problems. Emphasis will be placed on upgrading existing facilities, rather than attempting to develop processes and procedures for totally new treatment plants. The goal will be to satisfy NPDES permit limitations for designated pollutants, primarily phosphorus and nitrogen, as opposed to attempting to obtain design criteria for extremely low pollutant levels. Laboratory and bench scale studies will be conducted where appropriate in support of the pilot scale studies.						
25. (U) 7710 - 7809. A final draft report of the results of phosphorus removal studies has been prepared. A final draft report of the results of nitrogen removal studies is under preparation.						

DETAIL SHEET

TITLE: Development and Evaluation of Criteria for Advanced Wastewater Treatment Processes at Military Installations

WORK UNIT NO: 137

AGENCY ACCESSION NO: DA OA 6947

PRINCIPAL INVESTIGATOR: Miller, R.D.

BACKGROUND

The Federal Water Pollution Control Act Amendments of 1972 (PL92-500) were passed to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Specific sections of the Act of interest to the Army describe regulations for both pretreatment of pollutants before their introduction into publicly owned treatment works, and effluent guidelines and limitations leading to zero discharge of pollutants. Laboratory and pilot scale research was undertaken to assess technology most applicable to the Army's needs for complying with regulations and provisions of PL92-500.

PROGRESS

Nitrogen removal studies using the rotation biological contractor (RBC) have been completed. A final draft report of the results of nitrogen removal studies was initiated. A final draft report of the results of phosphorus removal studies has been prepared. Results of the RBC studies have been used at the Redstone Arsenal, AL, sewage treatment plant concept design meeting and the Fort Knox, KY, sewage treatment plant evaluation. Location of the pilot plant has been moved to facilitate increased capabilities.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁵	2. DATE OF SUMMARY ⁶	REPORT CONTROL SYMBOL	
				DA OA 6949	78 10 01	DD-DR&E(AR)636	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCFTY ⁷	6. WORK SECURITY ⁸	7. REGRADING ⁹	8. DISSEM INSTRNM	9. SPECIFIC DATA ¹⁰ CONTRACTOR ACCESS	10. LEVEL OF SUM A. WORK UNIT
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO./CODES ¹¹	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	62720A	3E162720A835		00	139 APC F639		
B. CONTRIBUTING							
C. OTHER WORKS ¹²	CARDS 114f						
11. TITLE (Provide full Security Classification Code) (U) Methods Development for the Characterization and Analysis of Low Level Military Pollutants							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ¹³ 007800 Hygiene and Sanitation; 008000 Industrial Processes; 012100 Organic Chemistry							
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7307	CONT		DA	C. In-House			
17. CONTRACT/GANT	18. EXPIRATION		19. RESOURCES ESTIMATE		20. PROFESSIONAL MAN YRS		21. FUNDS (in thousands)
A. DATES/EFFECTIVE:	EXPIRATION:		FISCAL YEAR	PREVIOUS	CURRENT	0.8	36
B. NUMBER ¹⁴				78			
C. TYPE ¹⁵	4. AMOUNT:			79		0.8	42
D. KIND OF AWARD ¹⁶	E. CUM. AMT.						
22. RESPONSIBLE DOO ORGANIZATION				23. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. GOVERNMENT INVESTIGATING) NAME: Barkley, J.J. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:			
24. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
25. KEYWORDS (Provide each with Security Classification Code) (U) Military Unique Pollutants; (U) Analysis of Pollutants; (U) Identification of Pollutants; (U) Pesticides; (U) Carbamates							
26. TECHNICAL OBJECTIVE, ¹⁷ 24 APPROACH, 25. PROGRESS (Punctuate individual paragraphs identified by number. Provide full of each with Security Classification Code)							
23. (U) To develop methods for the analysis of recognized militarily relevant low-level pollutants and pesticides and to characterize and analyze previously undefined pollutants arising from military munitions manufacture and pesticide operations. These methods would be used by USAEHA and other OTSG operational elements and munitions plant operators to survey or monitor specific pollutant discharges.							
24. (U) Methods will be developed for the routine determination of selected low-level pollutants in water or soil. Pollutant by-products and breakdown products in water, air or soil will be isolated, characterized, and quantified. Where necessary, sensitive methods will be devised to detect them at significant concentrations.							
25. (U) 7710 - 7809. A draft final report has been completed on a sensitive automated method for the analysis of nitrocellulose in water. An extraction procedure and a high pressure liquid chromatographic (hplc) method for the carbamate pesticides carbaryl and propoxur and their major degradation products, 1-naphthol and isopropoxyphenol, was developed. The extraction procedure was only 60 percent efficient but was specific for the compounds of interest. The reverse phase hplc method was capable of detecting the four compounds in the sub-part per million range, with relative sensitivities decreasing from 1-naphthol to propoxur. A draft report is being prepared.							

DETAIL SHEET

TITLE: Methods Development for the Characterization and Analysis of Low Level Military Pollutants

WORK UNIT NO: 139

AGENCY ACCESSION NO: DA OA 6949

PRINCIPAL INVESTIGATOR: Barkley, J.J.

BACKGROUND

Nitrocellulose is a principal ingredient of all military propellants. Nitrocellulose (NC) production requires a large amount of process water, most of which is discharged. The discharge water contains considerable amounts of NC fine particles, with NC concentration varying over a wide range. Due to this high concentration and a lack of a rapid specific analytical procedure, a need was recognized for an automated nitrocellulose analytical method.¹

US Army Medical Bioengineering and Research Laboratory was requested by the US Army Environmental Hygiene Agency (USAEEHA) to develop an analytical method for carbaryl and propoxur in soil.² USAEEHA is required to monitor soils for contamination under regulations set forth by the US Environmental Protection Agency. No simple, direct method for these common, generally-used pesticides existed.

PROGRESS

The development of a sensitive automated method for the analysis of nitrocellulose (NC) in water has been completed. The automated system utilizes a Technicon AutoAnalyzer II coupled with two AutoAnalyzer I dialyzers. The procedure consists of the formation of nitrite and nitrate by base hydrolysis of the nitrate ester (NC). The evolved nitrite and nitrate is quantitated by means of a modified Gries method for nitrite. Interfering anions are removed by dialysis. The method is capable of detecting 500 ug/l of nitrocellulose suspended in water. A final technical report on this effort is being prepared.

The analysis of the N-methyl-carbamic acid ester pesticides carbaryl (1-naphthyl-N-methylcarbamate) and propoxure (2-isopropoxyphenyl-N-methyl carbamate) and their respective chemical/biological transformation

products 1-naphthol and 2-isopropoxyphenol has been completed. The objective of the research was to develop a sensitive, direct high pressure liquid chromatography (HPLC) analytical procedure for the four compounds in soil. After completion of a literature review, the successful extraction from soil, separation and quantitation of carbaryl, propoxur 1-naphthol and 2-isopropoxyphenol has been accomplished by means of the hplc. The separation and quantitation of the four compounds have been accomplished by means of reverse phase hplc techniques. The minimum acceptable levels of the four compounds were found to be 0.3 mg/l for propoxur; 0.008 mg/l for iso-propoxyphenol; 0.001 for carbaryl and 1-naphthol. A draft final report will be available early in FY79.

REFERENCES

1. Rosenblatt, D.H., M.J. Small and J.J. Barkley, "Munitions Production Products of Potential Concern as Waterborne Pollutants - Phase I," USAMEERU Report 73-07, US Army Medical Environmental Engineering Research Unit, Edgewood Arsenal, MD (June 1973).
2. Letter, HQDA, HSE-RE, 5 Oct 1976, Subject: Research Requirements in Multiple Pesticide Residue Monitoring.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION DA 08 6936	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DRA&E(AR)635
3. DATE PREV SURVEY 78 06 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY U	6. WORK SECURITY U	7. REGRADING NA	8. DISBTH INSTN'R NL	9. SPECIFIC DATA <input checked="" type="checkbox"/> TBS <input type="checkbox"/> NO
10. NO./CODES* A. PRIMARY B. CONTRIBUTING XER900R90000	PROGRAM ELEMENT 62720A	PROJECT NUMBER 3E162720A835	TASK AREA NUMBER 00	11. WORK UNIT NUMBER 140 APC F640		
12. TITLE (Provide each with Security Classification Code)* (U) Evaluation of Disinfection Criteria for Water Intended for Army Field Use						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 005900 Environmental Biology; 003400 Civil Engineering						
14. START DATE 7307	15. ESTIMATED COMPLETION DATE 8009	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRANT	19. RESOURCES ESTIMATE	20. PROFESSIONAL MAN YRS 2.4	21. FUNDS (In thousands) 82			
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:	EXPIRATION: FISCAL YEAR CURRENT	78	22. FUNDING SOURCE FISCAL YEAR 79	2.7	123	
23. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701	24. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701					
25. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434	26. PRINCIPAL INVESTIGATOR / PUNICIAN TEAM II U.S. Academic Institutions NAME: Kenyon, K.F. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: NAME: Schaub, S.A. NAME: Taylor, G.W.					
27. GENERAL USE Foreign Intelligence Not Applicable	28. ASSOCIATE INVESTIGATORS NAME: POC:DA					
29. KEYWORD (Provide each with Security Classification Code) (U) Bacteriology; (U) Virology; (U) Infectious Disease; (U) Chlorination; (U) Water, drinking						
30. TECHNICAL OBJECTIVE, 31. APPROACH, 32. PROGRESS (Provide individual paragraphs identified by number. Provide each with Security Classification Code)						
23. (U) To evaluate US Army free available chlorine (FAC), disinfection criteria for fixed installation and field water supplies. The requirement for safe water supplies worldwide, under extreme chemical, microbiological and physical conditions makes this problem military unique. Pathogenic organisms must be eliminated from the treated waters to provide assurance that the waters will not cause infectious disease.						
24. (U) Literature on chlorine disinfection will be reviewed to determine if previous inability to distinguish FAC from other forms of available chlorine may have overestimated current military requirements. Species of FAC at various temperatures and pH will be examined for their capability to disinfect typical fecal-borne bacteria, viruses and protozoa in various waters over a standard 30 minute contact period. Actual field and fixed installation treated potable waters from various raw water sources will be evaluated to determine if any interference in rates of disinfection occur.						
25. (U) 7805 - 7809. Disinfection kinetics of <u>E. coli</u> , f2 coliphage, and poliovirus I, in water containing 5 color units of fulvic acid to simulate organic acid interference with FAC, were essentially unchanged compared to baseline kinetics as long as proper FAC residuals were maintained at constant levels by the addition of extra chlorine. Testing was done at pH 5 and 7, and 9 and 6°C. Disinfection kinetics in simulated turbid water (5 JTU bentonite) were unchanged when compared with baseline kinetics at pH 5 and 7, and 9 and 6°C. Poliovirus I survivors after 99.9% inactivation were plaque-isolated, regrown to a high titer, and retested at pH 5 and 6°C. A new stock was produced and also tested at pH 5 and 6°C. The isolates (and new stock virus) were found to exhibit the same chlorine resistance as the parent stocks, indicating that the unusual disinfection curves observed were not due to mixed virus populations. 53						
*Available to contractors upon information's approval.						

DETAIL SHEET

TITLE: Evaluation of Disinfection Criteria Intended for Army Field Use

WORK UNIT NO: 140

AGENCY ACCESSION NO: DA OB 6936

PRINCIPAL INVESTIGATOR: Kenyon, K.F.

BACKGROUND

The US Army has a need to evaluate free available chlorine (FAC) disinfection criteria for fixed installation and field water supplies. Present FAC requirements as listed in US Army documents (1, 2, 3) are ambiguous and range from 0.2 mg/l to 10 mg/l FAC depending on field conditions. Standard, chlorine demand free, disaggregated stocks of chlorine resistant microorganisms include Escherichia coli 11229, f2 coliphage, poliovirus I, and Rhodotorula rubra. These stocks have undergone baseline testing of disinfection kinetics under separate, varying conditions of FAC, chlorine demand, pH, temperature, Ca hardness, and turbidity. "Worst case" synthetic water and actual field and fixed installation treated potable waters from various raw water sources will be evaluated to determine if any interference in rates of disinfection occur. Selected water-borne pathogens as well as our standard microorganisms will be tested.

PROGRESS

Studies were conducted of the disinfection capabilities of FAC in waters containing 5 color units fulvic acid, simulating natural organic acid interference with FAC. Pretesting for chlorine demand indicated that approximately twice the amount of stock chlorine had to be added so that FAC residuals of 1.0, 0.5 and 0.25 mg/l could be maintained for at least 30 min. Disinfection kinetics of E. coli, f2 coliphage, and poliovirus I remained unchanged when compared with baseline kinetics done simultaneously at pH 5, 7 and 9 at 6°C. Data remained unchanged whether chlorine was added before (prereacted) or after (dynamic) organisms.

Disinfection kinetics of E. coli, f2 coliphage, and poliovirus I in simulated turbid waters containing 5 JTU turbidity (bentonite) were unchanged when compared with baseline kinetics at pH 5, 7 and 9 at 6°C and 22°C.

Poliovirus I was further tested at pH 5 and 6°C to determine the cause of the anomalous two-stage disinfection kinetics curve. Survivors after 99.9% inactivation were plaque-isolated, regrown to a high titer, and retested at pH 5 and 6°C. The isolates were found to exhibit the same two-stage chlorine resistance as the parent stock. This indicates that the unusual disinfection curves observed were not due to mixed virus populations. A new chlorine demand free stock of poliovirus I was grown and tested at pH 5 and 6°C. It also exhibited the same chlorine resistance as the original stock of virus.

REFERENCES

1. US Army Field Manual, Field Hygiene and Sanitation, FM 21-10 (July 1970).
2. US Army Technical Bulletin, Sanitary Control and Surveillance of Water Supplies at Fixed and Field Installations, TB Med 229 (August 1975).
3. US Army Technical Manual, Field Water Supply, TM 5-700 (July 1967).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ² DA OB 6199	2. DATE OF SUMMARY ³ 78 10 01	REPORT CONTROL SYMBOL DD-DRA&E(AR)636	
5. DATE PREV SURVEY 77 10 01	6. KIND OF SUMMARY D. CHANGE	8. SUMMARY ACTV ⁴ U	9. WORK SECURITY ⁵ U	7. REGRADING ⁶ NA	10. DISBPN INSTRN ⁷ NL	11. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	12. LEVEL OF SUM- MARY A. WORK UNIT
13. NO./CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY 62720A		3E162720A835		00	141 APC F699		
B. CONTRIBUTING							
15. TITLE (Provide text with Security Classification Code) (U) Development of Criteria for Wastewater Reuse Standards							
16. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁹ 007800 Hygiene and Sanitation; 009800 Medical and Hospital Equipment; 016800 Toxicology							
17. START DATE 7701	18. ESTIMATED COMPLETION DATE 8201	19. FUNDING AGENCY DA	20. PERFORMANCE METHOD C. In-House				
21. CONTRACT/GANT		22. RESOURCES ESTIMATE					
23. DATES/EFFECTIVE: EXPIRATION:		FISCAL YEAR	24. PROFESSIONAL MAN-YRS CURRENT	25. FUNDS (\$ in thousands)			
26. NUMBER: 27. TYPE: 28. KIND OF AWARD:		78	0.5	20			
29. CUM. AMT.		79	0.5	26			
30. RESPONSIBLE DOD ORGANIZATION		31. PERFORMING ORGANIZATION					
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Provide name if U.S. Army/DoD institution) NAME: Eaton, J.C. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Cowen, W.F. NAME: Cooper, W.J.					
32. GENERAL USE Foreign Intelligence Not Applicable		POC:DA					
33. KEYWORD (Provide each with Security Classification Code) (U) Wastewater; (U) Water Quality Standards; (U) Toxicity; (U) Wastewater Reuse							
34. TECHNICAL OBJECTIVE, 35. APPROACH, 36. PROGRESS (Provide individual paragraphs identified by number. Provide text of each with Security Classification Code)							
23. (U) To study health effects associated with renovation and reuse of wastewater in both potable and non-potable military applications, and to develop criteria upon which standards of quality for such renovated waters can be based.							
24. (U) Identify the known or predictable components of wastewaters generated at military installations and field facilities where water reuse may be required. Review the literature concerning acute and long-term health effects of ingestion of the identified components in potable water and the ocular and dermal effects in the case of nonpotable body contact applications such as laundry, bathing and recreational uses. Document the available knowledge, identify areas in which the necessary information is lacking, and recommend specific studies to obtain that information. Maximum use will be made of existing standards, rationales and health effects data, and the recommended criteria will be based upon the uses of the renovated wastewaters, the duration of exposure, the population exposed, and the military mission involved. Advice and recommendations will be sought from the National Academy of Sciences, and coordination will be maintained with interested government agencies and professional organizations.							
25. (U) 7710 - 7809. Two efforts were initiated in this period, one for development of a management plan for water quality criteria and one for identification of components and review and evaluation of treatability and health effects data related to reuse of field shower and laundry waters. Coordination has been initiated and maintained with cognizant military and non-military agencies and with the Joint Working Group on Water Requirements in an Arid Environment.							

DETAIL SHEET

TITLE: Development of Criteria for Wastewater Reuse Standards

WORK UNIT NO. 141

AGENCY ACCESSION NO: DA OB 6199

PRINCIPAL INVESTIGATOR: Eaton, J.C.

BACKGROUND

This work unit was established to cover the management and coordination efforts within USAMBRDL needed to develop water quality criteria for non-potable and potable wastewater reuse for use by the military in both field and fixed installations where reuse may be required. Most of the research done in the pursuit of these criteria will be performed under other work units or under contract outside this laboratory. Establishment of requirements, preparation of scopes of work, coordination with other agencies, monitoring and direction of outside efforts, assembly of all the results into a comprehensive criteria package and coordinating the review and approval process are the tasks to be performed under this work unit.

PROGRESS

An extramural effort was initiated to develop a management plan for development of water quality criteria for Army and Navy reuse requirements. The results of this study will form a basis for preparation of detailed protocols for development of military water quality criteria for non-potable reuse and will give a rationale and approach for development of potable criteria. Another effort initiated during this period was the assembly and evaluation of health effects data on the reuse of shower and laundry waters by field Army units. This study includes the formulation of a list of ingredients used in shower and laundry operation; an engineering evaluation of the treatability of each ingredient in four different wastewater treatment systems; assessment of availability and adequacy of dermal, ocular and oral toxicity data, and an assessment of the usefulness of previous studies related to the health effects of reuse of shower and laundry water.

Coordination efforts have included cooperation with the US Army Mobility Equipment R&D Command and the US Army Engineer School in the preparation of a draft Letter of Agreement on a wastewater treatment and reuse system and provision of guidance to the Academy of Health Sciences and the Engineer School on generation of a study requirement for new or revalidated field water quality criteria. Coordination has also been maintained with the user and doctrine agencies of the Army through the Joint Working Group on Water Requirements in an Arid Environment, and with the US Navy and Air Force. The Environmental Protection Agency, the Office of Water Research and Technology and the National Aeronautics and Space Agency have participated in in-process reviews of reuse water quality criteria projects at Fort Detrick.

COMBAT MEDICAL MATERIEL
(Military Medical Materiel, Exploratory Development)

3S162778A838

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RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV. SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SETT.	6. WORK SECURITY	DA OB 6206	78 10 01	DD-DR&E(AR)636
78 06 15	D. CHANGE	U	U	7. REGARDING*	8. DODIN INSTN#	9. SPECIFIC DATA:
				NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CDES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	62778A	35162778A838		00	001 APC F780	
B. CONTRIBUTING						
XXXXXX	CARDS 114f					
11. TITLE (Printed with Security Classification Code)						
(U) Sink Unit, Surgical, Field (NSN 6545-00-935-4056), Engineering Evaluation of						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS*						
002400 Bioengineering; 009800 Medical and Hospital Equipment						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7612	7901	DA		C. In-House		
17. CONTRACT/GRANT						
A. DATES/EFFECTIVE	EXPIRATION	18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (In thousands)
B. NUMBER*		FISCAL YEAR	PREVIOUS	CURRENT	0.1	02
C. TYPE			78		0.2	10
D. KIND OF AWARD		E. AMOUNT	79			
F. CUM. AMT.						
21. RESPONSIBLE DOD ORGANIZATION						
NAME* US Army Medical Bioengineering Research & Development Laboratory						
ADDRESS* Fort Detrick, Frederick, MD 21701						
RESPONSIBLE INDIVIDUAL						
NAME Dettor, C.M., COL						
TELEPHONE (301) 663-2434; AUTOVON 343-2434						
22. GENERAL USE						
Foreign Intelligence Not Applicable						
23. KEYWORD (Printed with Security Classification Code)						
(U) Surgical Sink; (U) Scrub; (U) Field Equipment; (U) Surgical Scrub						
24. TECHNICAL OBJECTIVE,* 25. APPROACH, 26. PROGRESS (Printed individual paragraphs identified by number. Print in full with Security Classification Code.)						
23. (U) To conduct an engineering evaluation of the field surgical sink to determine feasibility of conducting a product improvement program or a need for a new product design to eliminate field complaints.						
24. (U) Prepare a testing protocol based on accrued field complaints, conduct an in-house evaluation and prepare an engineering evaluation report so that a proper course of future action can be determined.						
25. (U) 7807 - 7810. Field survey indicates that 35 to 40 heaters and about 170 pumps are replaced in the field each year. The exact number of field units is unknown but is between 500 and 1000. It is therefore confirmed that problems warranting a product improvement program or a new product design exist.						

DETAIL SHEET

TITLE: Sink Unit, Surgical, Field (NSN 6545-00-935-4056), Engineering Evaluation Of

WORK UNIT NO: 001

AGENCY ACCESSION NO: DA OB 6206

PRINCIPAL INVESTIGATOR: Prensky, W. C.

BACKGROUND

This task was established in June of 1978 to evaluate numerous complaints of component failures (notably heaters and impeller pumps) and to determine if a Product Improvement Program or new product design is warranted.

PROGRESS

A field survey has confirmed that numerous failures of heaters (35 to 40) and pumps (170) occur annually for a field population of 500 to 1000 sink units. These failure rates confirm the need for corrective action.

REFERENCES

1. Letter; SGRD-OP, dated 22 May 1978; "Sink, Surgical, Field (NSN 6545-00-935-4056) (Manufacturer, Atlas Hospital Equipment Co., Model AHE 001A1)".
2. Letter; SGRD-UBE-G, dated 27 June 1978, "Sink Unit, Surigcal, Field (NSN 6545-00-935-4056), Engineering Evaluation of, Task No. A838.00.001".

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6179	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)626
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SCRTY# U	6. WORK SECURITY# U	7. REGARDING# NA	8. DISB'R INSTRN# NL	9. SPECIFIC DATA - CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES* a. PRIMARY XXXXXX	PROGRAM ELEMENT 62778A 62110A CARDS 114f	PROJECT NUMBER 3S162778A838 3A162110A816	TASK AREA NUMBER 00 00	WORK UNIT NUMBER 002 APC F767 002		
11. TITLE (Provide with Security Classification Code) (U) Decontaminator-Washer-Rinser; Engineering Evaluation of						
12. SCIENTIFIC AND TECHNOLOGICAL AREA 010100 Microbiology; 009800 Medical and Hospital Equipment						
13. START DATE 7607	14. ESTIMATED COMPLETION DATE 7803	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT	18. RESOURCES ESTIMATE TYPE/ESTIMATE FISCAL YEAR 78	19. PROFESSIONAL MAN YRS CURRENT 0.1	20. FUNDS (In thousands) 02			
21. DATES/EFFECTIVE: 22. NUMBER: 23. TYPE: 24. KIND OF AWARD:	25. EXPIRATION: 26. AMOUNT: 27. CUM. AMT.	28. 29. PERFORMING ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701	30. PRINCIPAL INVESTIGATOR /PUN/PA REAR // U.S. Academic Institution NAME* Prensky, W.C. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER ASSOCIATE INVESTIGATORS NAME* Hodge, J.W. NAME* Patzer, N.H.	31. POC:DA		
32. KEYWORD/PHRASE EACH WITH SECURITY CLASSIFICATION CODE (U) Washing Equipment; (U) Hospital Equipment; (U) Decontamination Equipment; (U) Engineering Evaluation; (U) Rinsing Equipment						
33. TECHNICAL OBJECTIVE* 34. APPROACH, 35. PROGRESS (Punctuate individual paragraphs identified by number. Provide test of both with Security Classification Code) (U) Medical Equipment						
23. (U) To conduct an Engineering Evaluation of a proposed piece of medical equipment, which has the capability to decontaminate, wash and rinse instruments and utensils.						
To identify the most efficient and microbiologically safe method of decontamination and processing instruments and utensils in the sterile preparation area of the military field hospital.						
24. (U) Prepare a test protocol and after approval conduct the evaluation.						
25. (U) 7710 - 7806. Engineering Evaluation Report completed. Report cited several mechanical deficiencies correctable with further development. However, because of large size, weight and power requirements, further development of this device for field use was not recommended. Consideration of simpler devices was suggested.						

DETAIL SHEET

TITLE: Decontaminator-Washer-Rinser, Engineering Evaluation Of

WORK UNIT NO: 002

AGENCY ACCESSION NO: DA OB 6179

PRINCIPAL INVESTIGATOR: Prensky, W. C.

BACKGROUND

This task was established on 4 August 1976. A breadboard of this equipment was sent to USAMBRDL for engineering evaluation after a clinical evaluation at Kimbrough Army Hospital, Fort Meade, MD.

PROGRESS

The engineering evaluation was completed and a report was sent to USAMRDC on 7 June 1978.

REFERENCES

1. Engineering Evaluation of the Castle Company Decontaminator-Washer-Rinser (DWR); dated 7 June 1978; USAMBRDL.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6214	2. DATE OF SUMMARY# 78 10 01	REPORT CONTROL SYMBOL DD-DRA&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY K. COMPLETION U	5. SUMMARY SECY# U	6. WORK SECURITY# U	7. REGRADING# NA	8. DISSEM INSTRN# NL	9. SPECIFIC DATA: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES* A. PRIMARY 62778A	PROGRAM ELEMENT PROJECT NUMBER 3S162778A838	TASK AREA NUMBER 00		WORK UNIT NUMBER 004 APC F787		
B. CONTRIBUTING XXXXXX/XXXX	CARDS 114F					
11. TITLE (Provide with Security Classification Code) (U) Norwegian Medical Supply Chest/Personnel Heater, Engineering Evaluation of						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 013300 Protective Equipment; 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE 7704	14. ESTIMATED COMPLETION DATE 7809	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (In thousands)
21. DATES/EFFECTIVE:		22. EXPIRATION:		FISCAL YEAR	PRECEDING	23. 0.2
24. NUMBER:		25. AMOUNT:		78	CURRENT	10
26. TYPE:		27. CUM. AMT.:		79	0.0	00
28. KIND OF AWARD:				29. PERFORMING ORGANIZATION		
30. RESPONSIBLE DOD ORGANIZATION		NAME* US Army Medical Bioengineering Research & Development Laboratory		NAME* US Army Medical Bioengineering Research & Development Laboratory		
ADDRESS* Fort Detrick, Frederick, MD 21701				ADDRESS* Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUAL		NAME* Detter, C.M., COL		PRINCIPAL INVESTIGATOR/PUNISHER (If U.S. Army/DoD personnel)		
TELEPHONE* (301) 663-2434; AUTOVON 343-2434				NAME* Patzer, N.H.		
31. GENERAL USE		TELEPHONE* (301) 663-7277; AUTOVON 343-7277		SOCIAL SECURITY ACCOUNT NUMBER		
Foreign Intelligence Considered				ASSOCIATE INVESTIGATORS		
				NAME* Crampton, K.T.		
				NAME* POC:DA		
32. KEYWORDS (Provide each with Security Classification Code) (U) Field Chests; (U) Personnel Warmer; (U) Heated Chest; (U) Cold Weather Equipment; (U) Personnel Heater; (U) Environmental Container						
33. TECHNICAL OBJECTIVE* 34. APPROACH* 35. PROGRESS (Provide individual paragraphs identified by number. Provide test of both with Security Classification Code)						
23. (U) To conduct an engineering evaluation of a heated cold weather supply chest and a personnel heater currently being used by the Norwegian Armed Forces.						
24. (U) Prepare an evaluation plan and conduct the tests.						
25. (U) 7710 - 7809. Chest and heater have been tested and evaluated. The chest was found generally acceptable for maintaining medical supplies inside above freezing (32°F) with outside temperatures down to -40°F. Further development based on the Norwegian chest and personnel heater has been recommended.						

DETAIL SHEET

TITLE: Norwegian Medical Supply Chest/Personnel Heater, Engineering Evaluation Of

WORK UNIT NO: 004

AGENCY ACCESSION NO: DA OB 6214

PRINCIPAL INVESTIGATOR: Patzer, N. H.

BACKGROUND

The Norwegian Defense Research Establishment has developed an insulated and heated medical supply chest for use in winter field conditions. The two cubic foot lightweight container is equipped with plastic drawers that allow storage of 30 to 40 pounds of freezable medical supplies. A dual heating system, charcoal or 24 volt AC/DC electric, is part of the container. On 29 April 1977 a task was assigned to conduct an engineering evaluation of the chest and the charcoal (personnel) heater.

PROGRESS

In 1977 and 1978 tests and evaluations of the chest and heater were completed. The performance of the chest was found to be generally acceptable down to -40° F. Further development of the chest, a more rugged outside container with increased insulation, has been recommended.

REFERENCES

1. Letter, SGRD-RO-D, 14 April 1977, Subject: Norwegian Medical Chests-Personnel Heaters.
2. Letter, SGRD-OPM, 29 July 1977, Subject: Norwegian Heated Container.
3. Letter, SGRD-UBE-G, 18 August 1978, Subject: Norwegian Medical Supply Chest/Personnel Heater, Evaluation, Task No. A838.00.004. (MR 2-78, MR 7-78 and MR 17-78).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY	6. WORK SECURITY	DA DA 6209	78 10 01	DD-DR&E(AR)636
78 01 16	H. TERMINATION	U	U	NA	NL	DB SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES* PROGRAM ELEMENT PROJECT NUMBER				TASK AREA NUMBER		8. LEVEL OF SUM A. WORK UNIT
A. PRIMARY	62778A	3S162778A838	00	005 APC F722		
XXXXXXX	62110A	3A162110A816	00	005		
XXXXXXX	CARDS 114f					
11. TITLE (PRINT IN BLOCK LETTERS WITH Security Classification Code)* (U) Container, Adjustable, Subsistence Test Weight						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 006500 Food; 007800 Hygiene and Sanitation						
13. START DATE 6711	14. ESTIMATED COMPLETION DATE 7803		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GRAANT			18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS 0.0	20. FUNDS (in thousands) 00
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:			FISCAL YEAR 78	CURRENT 79	21. PERFORMING ORGANIZATION	
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		PRINCIPAL INVESTIGATOR (PRINT IN BLOCK LETTERS WITH Security Classification Code) NAME: Cranford, H.B. TELEPHONE: (301) 663-7277; AUTOVON 343-7277	
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434			SOCIAL SECURITY ACCOUNT NUMBER		ASSOCIATE INVESTIGATORS NAME: Patzer, N.H.	
22. GENERAL USE Foreign Intelligence Not Applicable			NAME:		POC:DA	
23. KEYWORDS (PRINT IN BLOCK LETTERS WITH Security Classification Code) (U) Frozen Foods; (U) Net Weight; (U) Food Inspection; (U) Food; (U) Container; (U) Weight; (U) Inspection						
24. TECHNICAL OBJECTIVE,* 25. APPROACH, 26. PROGRESS (Print in block letters identified by number. Proceed next of each with Security Classification Code.)						
23. (U) To devise a method of determining the net weight of frozen foods such as pork loins, chickens, hams, pork butts, etc., that will permit repacking in the original container. This device will be used by Veterinary Corps personnel in the performance of their assigned mission of monitoring the quality of food procured for Army personnel.						
24. (U) Design of a rack that will permit removal of the frozen food, plus repacking without disturbing the orientation of the contents.						
25. (U) 7710 - 7801. Test results and professional evaluation concludes that item is not suitable for its intended use. Task terminated.						

DETAIL SHEET

TITLE: Container, adjustable, Subsistence Test Weight

WORK UNIT NO: 005

AGENCY ACCESSION NO: DA OA 6209

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The purpose of this project is to develop a method of inspecting and determining the net weight of frozen foods which will permit repacking into their original container, without altering the product configuration. The task was initiated by the U.S. Army Medical Service Meat and Drug Hygiene School. Unsatisfactory prototypes were fabricated by a contractor and field tested during 1961. One of the initial prototypes was redesigned by the U.S. Army Medical Equipment Research and Development Laboratory, reference 4a. Subsequent tests of the modified configuration were made in 1971 by the Veterinary Office in Fort Dix, New Jersey, with negative results, reference 4b. Additional testing in 1972 of a slightly different variation of the prototype had similarly negative results.

In 1974 based upon request by the Medical R&D Command, reference 4c, a prototype of the Test Weight Adjustable Container and an especially designed carrying case were sent out with a Plan of Professional Evaluation, reference 4d, for testing. On 13 March 1975, a request, reference 4e, was received by this Laboratory to fabricate one hundred (100) containers. These items were to be shipped to various Army Veterinary activities for their evaluation and use. Minor modifications resulting from the field evaluation reports would be used to optimize the equipment during the manufacturing period. All prototype units have been fabricated and tested.

PROGRESS

Test results and professional evaluation indicated that containers fabricated for test purposes were adequate to meet service requirements and that no additional containers would be required. Accordingly task was terminated.

REFERENCES

1. Evaluation Report, 1 September 1970, Office for Veterinary Activities, Fort Dix, New Jersey.
2. Evaluation Report, 27 July 1971, Office for Veterinary Activities, Fort Dix, New Jersey.
3. Letter, SGRD-SDM, 25 March 1974, subject: Container, Adjustable, Subsistence, Test Weight.
4. Plan of Professional Evaluation, Container Subsistence, Test Weight, 1 May 1974.
5. Letter, SGRD-SDM, 13 March 1975, subject: Container, Adjustable, Subsistence, Test Weight.
6. Letter, SGRD-OPM, 14 Dec 1977, Subject: Container, Adjustable, Subsistence, Test Weight (Task A838.00.005).

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RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY ACT#	6. WORK SECURITY	DA OA 6237	78 10 01	DD-DR&E(AR)626
77 10 01	D. CHANGE	U	U	NA	NL	
10. NO./CODES* PROGRAM ELEMENT PROJECT NUMBER				TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	62778A	35162778A838		00	006 APC F702	
XXXXXXXX	62110A	3A162110A816		00	006	
XXXXXXXX	CARDS 114F					
11. TITLE (Indicate with Security Classification Code)* (U) Dental Plastic Insert Module						
12. SCIENTIFIC AND TECHNOLOGICAL AREA* 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE 6910	14. ESTIMATED COMPLETION DATE 7909		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS 0.0	20. FUNDS (In thousands) 00	
A. DATES/EFFECTIVE:		B. EXPIRATION:		FISCAL YEAR 78	C. FUNDING AMT. 0.0	
D. NUMBER:		E. AMOUNT:		CURRENT 79	F. CUM. AMT. 0.0	
G. TYPE:		H. PERFORMING ORGANIZATION		I. NAME US Army Medical Bioengineering Research & Development Laboratory Fort Detrick, Frederick, MD 21701		
I. KIND OF AWARD:		J. ADDRESS		K. PRINCIPAL INVESTIGATOR (Print in capital letters) NAME: Malek, J.W. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:		
21. RESPONSIBLE DOD ORGANIZATION		22. RESPONSIBLE INDIVIDUAL		L. POC:DA		
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				
23. GENERAL USE Foreign Intelligence Not Applicable						
24. KEYWORD (Print in capital letters) (U) Dental Portable Equipment; (U) Dental Field Units; (U) Dental Field Sets; (U) Plastic; (U) Module; (U) Field Insert; (U) Field Cabinet						
25. TECHNICAL OBJECTIVE* 26. APPROACH 28. PROGRESS (Print individual paragraphs identified by number. Print in capital letters) 23. (U) To develop a plastic insert module which will provide field dental personnel with a modern, mobile piece of equipment.						
24. (U) Fabricate universal plastic instrument and equipment modules compatible with Chest, Medical Instrument and Supply Set (MISS) (NSN 6545-00-118-6248) complete with three sizes of interchangeable drawers and a mobile base platform.						
25. (U) 7710 - 7809. None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.						

DETAIL SHEET

TITLE: Dental Plastic Insert Module

WORK UNIT NO: 006

AGENCY ACCESSION NO: DA OA 6237

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

These modules were intended to replace the current inserts which contain the instruments, medicaments and supplies of the current Dental Equipment Set, General Dentistry, Field; Dental Equipment Set, Dental Hygienist, Field; Dental Equipment Set, Prosthetic Field; Dental Equipment Set, Dental Service Augmentation; and Dental Equipment Set Operating, Field. A fresher and significant aim was to provide instrument and equipment cabinetry that was suitable for use in both field and overseas Garrison Treatment environments. Seventy (70) modules were fabricated under contract with the Gilbert Plastics, Inc., between February 1969 and January 1970. They were designed as inserts which would fit into the Chest, MISS, in groups of three. Each module could accommodate either two (2), four (4), or eight (8) inch drawers, for a total accommodation of eight (8) inches. Each group of three modules was supported by a plastic mobile base. Preproduction modules were successfully subjected to Environmental Testing in October 1969. Nine (9) modules and three (3) mobile bases were permanently transferred to the USAF School of Aviation Medicine for USAF evaluation and disposition.

Three (3) modules and one (1) mobile base were permanently transferred to the Pan American Health Organization of the World Health Organization for use at the University of Zulia in Maracaibo, Venezuela. Six (6) modules and two (2) mobile bases were permanently transferred to the USAH, Asmara, East Africa. The plastic invert modules were subjected to clinical evaluation in February-March 1970 at Fort Sam Houston, Texas. This evaluation indicated general acceptability of the items with minor deficiencies. Exterior retention locks were added in lieu of Velcro retainers, to retain the drawers when laden with instruments and equipment. Stainless steel sterilizer trays were added as replacements for a deleted Bracket Tray assembly. After modification, six (6) modules and two (2) mobile bases contained in Chest, MISS, were shipped to USAREUR in February 1971 for inclusion in a Military Potential Test (MPT) of field dental equipment prototypes. An interim evaluation report of June 1971 indicated general acceptability and suitability of the modules in all treatment environments. The evaluation report indicated that the

modules were structurally sound for all intended uses. Three (3) modules are deemed adequate per operator once an optimal packaging of component instrumentation and equipment is complete. In response to the suggestion of the Dental Project Officer, USAMRDC, the casters of the mobile bases to a moveable free-wheeling type was accomplished.

PROGRESS

None - Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. QMDO for Field Dental Equipment, 6 March 1967. (Cancelled)
2. Contract DADA17-69-C-9081, Gilbert Plastics, Inc., February 1969.
3. Clinical Evaluation, Fort Sam Houston, Texas, March 1970.
4. Military Potential Test, USAREUR, February-May 1971.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY	6. WORK SECURITY	7. REGRADING	8. DAISIN INSTN	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
a. PRIMARY	62778A	3S162778A838		00		007 APC F703	
KXXXXXXKX	62110A	3AT62110A816		00		007	
XXXXXXXKX	CARDS 114f						
11. TITLE (Provide with security classification code)							
(U) Dental Operating Set							
12. SCIENTIFIC AND TECHNOLOGICAL AREA*							
009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD			
6910	7909	DA		C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)	
a. DATE/EFFECTIVE:		b. EXPIRATION:		c. FISCAL YEAR		d. CURRENT	
b. NUMBER:				78		0.0	
c. TYPE:		d. AMOUNT:		79		0.0	
e. KIND OF AWARD:		f. CUM. AMT.:					
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION					
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (FUNDING FROM U.S. GOVERNMENT)					
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		NAME: Malek, J.W. TELEPHONE: (301) 663-7277; AUTOVON 343-7277					
23. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER		ASSOCIATE INVESTIGATORS			
Foreign Intelligence Not Applicable		NAME:		NAME:		POC:DA	
NAME:		NAME:					
24. KEYWORD (Provide with security classification code) (U) Dental Portable Equipment; (U) Dental Field Sets; (U) Dental Sets; (U) Dental Operating Set							
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Provide last of each with security classification code.)							
23. (U) To update and modernize the current Dental Equipment Set, Operating, Field NSN 6545-00-918-0050.							
24. (U) Evaluate contents and recommend deletions and/or additions after acceptable review; evaluate packing of components into plastic insert modules being developed under Task 838.00.006, then clinically evaluate the modular concept with reference to revised TOE.							
25. (U) 7710 - 7809. An Ad Hoc Committee consisting of dental officers having field expertise reviewed the contents testing for current up-to-date requirements. Upon completion of their review and analysis, trial packing will be reinitiated. However, work unit will be held in abeyance pending receipt of a requirements document and adequate funding.							

DETAIL SHEET

TITLE: Dental Operating Set

WORK UNIT NO: 007

AGENCY ACCESSION NO: DA OA 6238

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

Concurrent with design and fabrication of Dental Plastic Inserts Modules, effort has been initiated to encase the dental specialty sets in assemblies of plastic modules. The Dental Operating Set was intended to replace the instrument/medicament/supplies portion of the Dental Equipment Set, Operating Field. A component list acceptability is dependent upon the acceptability of the Dental Plastic Insert Modules which are intended to contain them, as well as professional assessment and approval. Various configurations have been made over the years, but a firm solid component list has not been established.

PROGRESS

None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. QMDO for Field Dental Equipment, 6 March 1967. (Cancelled)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY U	6. WORK SECURITY U	DA DA 6239	78 10 01	DD-DR&E(AR)636	
				7. REGADING#	8. DISCRN INSTN#	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
				NA	NL		
				11. NO. /CODES* PROGRAM ELEMENT	PROJECT NUMBER	12. WORK UNIT NUMBER	
				A. PRIMARY 62778A	3S162778A838	00	008 APC F704
				XRMXXXXXX 62110A	3A162110A816	00	008
				XRMXXXXXX CARDS 114f			
13. TITLE (Print in full with Security Classification Code)* (U) Dental Prosthodontic Set							
14. SCIENTIFIC AND TECHNOLOGICAL AREA* 009800 Medical and Hospital Equipment; 002400 Bioengineering							
15. START DATE 6910		16. ESTIMATED COMPLETION DATE 8009		17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House		
19. CONTRACT/GRANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN YRS 78	22. FUNDS (in thousands) 00		
23. DATES/EFFECTIVE: N. NUMBER: O. TYPE: P. KIND OF AWARD:		EXPIRATION: FISCAL YEAR 78		TOTAL 79	24. PERFORMING ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701 PRINCIPAL INVESTIGATOR (Print in full if U.S. Academy Institution) NAME* Malek, J.W. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER ASSOCIATE INVESTIGATORS NAME: NAME: POC:DA		
25. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		26. KEYWORD (Print in full with Security Classification Code)* (U) Dental Portable Equipment; (U) Dental Field Sets; (U) Prosthetic; (U) Dental Prosthodontic Set					
27. TECHNICAL OBJECTIVE, 28. APPROACH, 29. PROGRESS (Print in full paragraphs identified by number. Previous text of work with Security Classification Code)*							
23. (U) To update and modernize the current Dental Equipment Set, Prosthetic, Field (FSN 6545-918-4750). To package components for fixed and removable assemblages.							
24. (U) Prepare component listings and pack proposed components into the Plastic Insert Modules being developed under Task 838.00.006. Evaluate clinically the modular concept.							
25. (U) 7710 - 7809. None. Work unit will be held in abeyance pending receipt of requirements document and adequate funding.							

DETAIL SHEET

TITLE: Dental Prosthodontic Set

WORK UNIT NO: 008

AGENCY ACCESSION NO: DA OA 6239

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

Concurrent with design and fabrication of Dental Plastic Insert Module, effort has been initiated to encase dental specialty sets in assemblies of plastic modules. The Dental Prosthodontic Set was intended to provide the Prosthodontist in the field and overseas garrison with a suitable prosthetic capability and replace the current Dental Equipment Set, Prosthetic Field. Acceptability of revised component inventory is dependent upon acceptability of Dental Plastic Insert Modules for all parts of the set. Several trial packagings of this set using different component lists have been initiated.

PROGRESS

None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. QMDO for Field Dental Equipment, 6 March 1967.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
77 10 01	D. CHANGE	U	U	DA OB 6219	78 10 01	DD-DR&E(AR)636	
10. NO. /CODES*	PROGRAM ELEMENT	PROJECT NUMBER		7. REGRADING*	8. DSBIN INSTN#	9. SPECIFIC DATA-CONTRACTOR ACCESS	9. LEVEL OF SUM-A. WORK UNIT
A. PRIMARY	62778A	3S162778A838		NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
B. CONTRIBUTING				00	009 APC F793		
C. CARDS 114f							
11. TITLE (Printed with Security Classification Code)* (U) Tactical Ambulance Adaptation, Feasibility Study of							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 002400 Bioengineering; 009800 Medical and Hospital Equipment							
13. START DATE 7705	14. ESTIMATED COMPLETION DATE 8209	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House				
17. CONTRACT/GANT		18. RESOURCES ESTIMATE					
A. DATES/EFFECTIVE:		19. PROFESSIONAL MAN YRS FISCAL 78 YEAR CURRENT	20. FUNDS (in thousands) 02				
B. NUMBER*		21. CUM. AMT. 79	69				
C. TYPE:		22. PERFORMING ORGANIZATION					
D. KIND OF AWARD:		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701					
E. RESPONSIBLE DOD ORGANIZATION		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701					
F. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR/PUNIC SPAN IF U.S. Academy Involved NAME* Conway, W.H. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Cranford, H.B.					
G. GENERAL USE Foreign Intelligence Not Applicable		POC:DA					
23. KEYWORD (Printed each with Security Classification Code) (U) Ambulance; (U) Tactical Ambulance; (U) Emergency Medical Vehicle; (U) Medical Transport							
24. TECHNICAL OBJECTIVE,* 25. APPROACH, 26. PROGRESS (Printed individual paragraphs identified by number. Print in last of each with Security Classification Code.)							
23. (U) To conduct a study of the Army's needs in tactical ambulances and their capabilities in preparation for the next major procurement.							
24. (U) Initiate a study program to identify the number and type of vehicles needed, the required medical capabilities of each and the logistical implications. The results of this study will be a comprehensive requirements document.							
25. (U) 7710 - 7809. A proposal for a Joint Working Group has been drafted and is being circulated for approval.							

DETAIL SHEET

TITLE: Tactical Ambulance Adaptation, Feasibility Study of

WORK UNIT NO: 009

AGENCY ACCESSION NO: DA OB 6219

PRINCIPAL INVESTIGATOR: Conway, W. H.

BACKGROUND

This task was originally established to consider replacement vehicles for the M886 series field ambulances in response to many complaints received against that vehicle. After initial discussions with the Tank and Automotive Command and the Combat Developer, it was discovered that no comprehensive set of standards exists to guide the procurement of tactical ambulances. Consequently, the study has been expanded to include all types of tactical ambulances and the goal has been revised to develop a set of standards.

PROGRESS

A proposal has been drawn up which calls for the convening of a Joint Working Group consisting of representation from all Army agencies having to do with tactical ambulances. This group would meet periodically over the next five years and would develop comprehensive medical standards for use in the procurement of all types of tactical ambulances in the near future.

REFERENCES

1. Letter, Department of the Army, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, dated 9 March 1977, Subject: Feasibility Study, Improvement in Patient Handling/Treatment in Tactical Ambulance Adaptation of Commercial 1½ ton Truck.
2. Letter, U.S. Army Medical Bioengineering Research and Development Laboratory, Ft. Detrick, Frederick, Maryland, SGRD-UBE-G, dated 29 Aug 1978. Subject: Establishment of Joint Task Group, Proposal For.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	7. REGRADING*	8. DISSEM' INSTRNM	9. SPECIFIC DATA- CONTRACTOR ACCESS	
78 05 01	H. TERMINATION U		U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
				10. NO./CODES*		11. LEVEL OF SUM A. WORK UNIT	
				PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
				A. PRIMARY XXXXXXXXXX	62778A	00	010 APC F759
				K. CONTRACTOR ACCESS XXXXXXXXXX	62110A	00	010
				M. CARD NUMBER XXXXXXXXXX	CARDS 114f		
11. TITLE (Prelude with Security Classification Code)* (U) Sterilizing Equipment Engineering Assistance and Prototype Fabrication							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 009800 Medical and Hospital Equipment; 010100 Microbiology							
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD		
7508		7805		DA	C. In-House		
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS			
A. DATES/EFFECTIVE:		B. EXPANSION:		FISCAL YEAR	78	0.1	
C. NUMBER:		D. AMOUNT:		CURRENT	01		
E. TYPE:		F. CUM. AMT.:		79	0.0	00	
G. KIND OF AWARD:		H. RESPONSIBLE DOO ORGANIZATION		20. PERFORMING ORGANIZATION			
I. RESPONSIBLE INDIVIDUAL		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
J. TELEPHONE:		(301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR / JUNIOR TEAM II U.S. ACCORDING PRACTICALLY NAME: Prensky, W.C. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: O'Connor, R.J.			
K. GENERAL USE		Foreign Intelligence Not Applicable		POC:DA			
21. KEYWORD (Prelude each with Security Classification Code): (U) Sterilizing; (U) Field Equipment; (U) Medical; (U) Field Sterilization; (U) Field Sterilizers; (U) Portable Sterilizers							
22. TECHNICAL OBJECTIVE,* 23. APPROACH, 24. PROGRESS (Prelude individual paragraphs identified by number. Prelude rest of each with Security Classification Code.)							
23. (U) To provide engineering support to evaluate evolving new processing/sterilizing equipment for military field use.							
24. (U) Professionally evaluate new items of sterilizing equipment.							
25. (U) 7710 - 7804. No progress. IPR of 21-23 March 1978 recommended termination of this task because individual work units have been established for specific pieces of equipment.							

DETAIL SHEET

TITLE: (U) Sterilizing Equipment Engineering Assistance and Prototype Fabrication

WORK UNIT NO: 010

AGENCY ACCESSION NO: DA OB 6164

PRINCIPAL INVESTIGATOR: Prensky, W. C.

BACKGROUND

This task was established in August 1975 to provide engineering assistance during the term of a Phase II contract to Castle Company for the design and construction of prototype sterilization devices. As the prototypes were completed and entered into clinical and engineering testing, new, individual work units were established for the equipment.

PROGRESS

This work unit was no longer required and it was recommended for termination by the IPR of March, 1978.

REFERENCES

1. Letter, SGRD-OP, 20 Apr 1978, "Recommendations/Decisions of Joint Working Group, 22 Mar 1978".
2. Letter, SGRD-UBE, 22 May 1978, "Termination of Work Units".

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL DD-DR&E(AR)828	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY ACTY ³	6. WORK SECURITY ⁴	7. REGARDING ⁵	8. DISRBN INSTRN ⁶	9. SPECIFIC DATA ⁷ CONTRACTOR ACCESS	10. LEVEL OF SUM YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>
77 10 01	D. CHANGE	U	U	NA	NL	11. WORK UNIT	
10. NO./CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	62778A	3S162778A838		00		011 APC F707	
XX9XXXXXXX	62110A	3A162110A816		00		011	
XX9XXXXXXX	CARDS 114F						
11. TITLE (Provide with Security Classification Code) (U) Dental Hygienist Set							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 007800 Hygiene and Sanitation							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD				
6910	7909	DA	C. In-House				
17. CONTRACT/DRAFT	18. EXPIRATION	19. RESOURCES ESTIMATE	20. PROFESSIONAL MAN YRS		21. FUNDS (in thousands)		
22. DATES/EFFECTIVE:		FISCAL YEAR	PREVIOUS	0.0	00		
23. NUMBER:		YEAR	78	0.0	00		
24. TYPE:			CURRENT	79	00		
25. KIND OF AWARD:							
26. RESPONSIBLE DOD ORGANIZATION		27. PERFORMING ORGANIZATION					
NAME* US Army Medical Bioengineering Research & Development Laboratory	ADDRESS* Fort Detrick, Frederick, MD 21701	NAME* US Army Medical Bioengineering Research & Development Laboratory	ADDRESS* Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (Provide NAME if U.S. Academic Institution)					
NAME: Dettor, C.M., COL	TELEPHONE: (301) 663-2434; AUTOVON 343-2434	NAME: Malek, J.W.	TELEPHONE: (301) 663-7277; AUTOVON 343-7277				
28. GENERAL USE	29. KEYWORD (Print each with security classification code)	30. SOCIAL SECURITY ACCOUNT NUMBER					
Foreign Intelligence Not Applicable	(U) Dental Field Systems; (U) Dental Field Equipment; (U) Hygienist; (U) Dental Hygienist Set	ASSOCIATE INVESTIGATORS	NAME:	NAME:	POC:DA		
31. TECHNICAL OBJECTIVE, 32. APPROACH, 33. PROGRESS (Print individual paragraphs identified by number. Provide level of each with Security Classification Code)	<p>23. (U) To modernize the current Dental Hygienist Set (NSN 6545-00-142-8896).</p> <p>24. (U) Review components and pack components into the Plastic Insert Modules being developed under Task 838.00.006, then clinically evaluate the modular concept.</p> <p>25. (U) 7710 - 7809. None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.</p>						

DETAIL SHEET

TITLE: Dental Hygienist Set

WORK UNIT NO: 011

AGENCY ACCESSION NO: DA OA 6242

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

This task was established to develop a modified Dental Equipment Set, Dental Hygienist, Field and repackaged into an assembly of plastic modules and provide a sophisticated hygiene capability for both field and over-seas garrison dental service. Completion of the effort is dependent upon the acceptability of the Dental Plastic Insert Modules. Several trial packagings of this set using different component lists have been initiated.

PROGRESS

None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. QMDO for Field Dental Equipment, 6 March 1967. (Cancelled)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁵	2. DATE OF SUMMARY ⁶	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY ACTY ⁷	6. WORK SECURITY ⁸	7. REGRADING ⁹	8. CISON INSTN ¹⁰	9. SPECIFIC DATA ¹¹
78 05 01	H. TERMINATION	ON U	U	NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	12. WORK UNIT NUMBER	
A. PRIMARY	62778A	35162778A838		00	012 APC F761	
B. X00X0XXXXXX	62110A	3A162110A816		00	012	
C. X00X0XXXXXX	CARDS 114F					
13. TITLE (Provide with security classification code) 009800 Medical and Hospital Equipment; 002400 Bioengineering						
14. START DATE	15. ESTIMATED COMPLETION DATE	16. FUNDING AGENCY	17. PERFORMANCE METHOD			
7510	7805	DA	C. In-House			
18. CONTRACT/GRANT	19. DATES/EFFECTIVE	20. RESOURCES ESTIMATE	21. PROFESSIONAL MAN-YRS		22. FUNDS (in thousands)	
	EXPIRATION:	PREVIOUS	FISCAL YEAR	CURRENT	0.1	07
		78			0.1	00
		79				
23. RESPONSIBLE DOO ORGANIZATION	24. PERFORMING ORGANIZATION	25. PRINCIPAL INVESTIGATOR (Provide name if U.S. Academy staffing)				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701	NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701	NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434	ASSOCIATE INVESTIGATORS NAME: O'Connor, R.J. NAME: Stup, J.L.	POC:DA				
26. KEY WORDS (Provide each with security classification code) (U) Blood; (U) Flow; (U) Ultrasound; (U) Vascular; (U) Doppler; (U) Non-Invasive						
27. TECHNICAL OBJECTIVE, 28. APPROACH, 29. PROGRESS (Provide individual paragraphs identified by number. Provide text of para with security classification code.)						
23. (U) A need exists for a non-invasive portable vascular blood flow measuring device and foreign body locator for field military hospital use.						
24. (U) Instrumentation will be developed to provide a continuous as well as a frequency modulated scan of blood vessels. The feasibility of storing and processing the data from these scans to provide image and flow information will also be investigated.						
25. (U) 7710 - 7804. A technique was conceived which would permit elimination of the spectrum analyzer and permit presentation of the information with much less complex electronics. This work unit was terminated per Joint Working Group held at USAMRDL 22 March 1978.						

DETAIL SHEET

TITLE: Volume Flow Evaluator, Ultrasonic Non-Invasive

WORK UNIT NO: 012

AGENCY ACCESSION NO: DA OB 6166

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

This project was initiated in 1975 for the purpose of developing an instrument which would provide a non-invasive technique for determining blood vessel diameters. Such a system when used with the already developed ultra sonic doppler flow meter, would permit measurement of blood volume flow and would be of use in the diagnosis of circulatory disorders.

The technique decided on was an adaption of a radar altimeter system used for guided fuzing and aircraft navigation with the carrier shifted from the R. F. range to the ultra sonic range. A frequency modulated ultra sonic signal is propagated through the tissue and an echo is returned from the various discontinuities, within the tissue. This echo is then compared with the transmitted signal and a difference frequency is obtained. This difference frequency is a direct function of the distance, propagation rate, and the modulation rate. With known propagation and modulation rates the difference frequency can be directly related to the distance. The resolution of the system is a function of the deviation of the transmitted signal and the modulation rate. These are limited by ambiguity considerations and the ability of the system to respond to rapid changes.

Initially, an attempt was made to modify a commercial ultra sonic flow meter. This was abandoned because of intermodulation band width and nonlinear response problems. The system finally developed consists of a phase-lock-loop modulated by a I.C. function generator for the 10 MHZ ultra sonic transmitter. The receiver section consists of a preamplifier, mixer, and low-pass filter. Presently, a storage oscilloscope and spectrum analyzer is used as the display.

PROGRESS

This task was terminated at a joint working group held at USAMBRDL, 22 March 1978.

REFERENCES

1. "Frequency Modulated Ultrasonic Doppler Flowmeter", K. McCarty, J. P. Woodcock, Journal of Medical and Biological Engineering, January 1975.
2. SGRD-SDM to USAMBRDL, 17 September 1975, Subject: Non-Invasive Measurement of Blood Flow.
3. Letter, SGRD-OP, dated 20 April 1978, Subject: Recommendations/Decisions of Joint Working Group, 22 March 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL DD-DR&E(AR)636		
3. DATE PREV SUMM ^c	4. KIND OF SUMMARY	5. SUMMARY SCRT ^d	6. WORK SECURITY ^e	7. REGRADING ^f	8. DISSEM INSTN ^g	9. SPECIFIC DATA CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		
77 10 01	D. CHANGE	U	U	NA	NL	10. LEVEL OF SUM A. WORK UNIT		
10. NO./CODES ^h				PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	62778A	3S162778A838	00	013 APC F709				
XXXXXX	62110A	3A162110A816	00	013				
XXXXXX	CARDS T14F							
11. TITLE (Provide with security classification code) (U) Dental Supplemental Operating Set								
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁱ 009800 Medical and Hospital Equipment; 002400 Bioengineering								
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD					
6910	7909	DA	C. In-House					
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (in thousands)		
21. DATE EFFECTIVE:				EXPIRATION:	FISCAL YEAR	78	0.0	00
22. NUMBER ^j				CURRENT	79	0.0	00	
23. TYPE				4. AMOUNT:	24. PERFORMING ORGANIZATION			
25. KIND OF AWARD:				E. CUM. AMT.	NAME ^k US Army Medical Bioengineering Research & Development Laboratory ADDRESS ^l Fort Detrick, Frederick, MD 21701			
26. RESPONSIBLE DOD ORGANIZATION				NAME ^k US Army Medical Bioengineering Research & Development Laboratory ADDRESS ^l Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (POWER SHARE II U.S. ARMY/DOE INSTITUTE) NAME ^k Malek, J.W. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:				
27. GENERAL USE				POC:DA				
28. KEYWORD (Provide each with security classification code) (U) Dental Field Set; (U) Resupply; (U) Dental Portable Equipment; (U) Dental Resupply Set								
29. TECHNICAL OBJECTIVE ^m ; 30. APPROACH; 31. PROGRESS (Provide individual paragraphs identified by number. Provide text of each with security classification code.)								
23. (U) To develop a resupply set for use in field dental treatment systems.								
24. (U) Prepare a component listing and pack components in the Plastic Insert Module being developed under Task 838.00.006, then clinically evaluate the concept.								
25. (U) 7710 - 7809. None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.								

DETAIL SHEET

TITLE: Dental Supplemental Operating Set

WORK UNIT NO: 013

AGENCY ACCESSION NO: DA OA 6244

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

Concurrent with the design and fabrication of Dental Plastic Insert Modules, effort was initiated to encase dental speciality sets in plastic modules. It was intended that a standard resupply set be configured and contained within the plastic modules so as to provide a ready re-furnishement of expandable materials. Reconsideration of the necessity for such a pre-packaged modular resupply element has resulted in a negative conclusion. This task was retained to supplement development effort of the Dental Operating Set.

PROGRESS

None. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. QMDO for Field Dental Equipment, 6 March 1967. (Cancelled)

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY CITY ⁴	6. WORK SECURITY ⁵	DA 0B 6172	78 10 01	DD-DRAE(AR)626
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES ⁶ PROGRAM ELEMENT				7. REGRADING ⁷	8. DISSEM INSTN ⁸	9. LEVEL OF SUM
A. PRIMARY XXXXXX	62778A 62110A	3S162778A838 3A162110A816	C. WORK UNIT CARDS 114f	00	016 APC F762	WORK UNIT NUMBER
11. TITLE (Printed with Security Classification Code) (U) Whole Body Diagnostic X-Ray Scanner						
12. SCIENTIFIC AND TECHNOLOGICAL AREA ⁹ 003500 Clinical Medicine; 009800 Medical and Hospital Equipment						
13. START DATE 7602	14. ESTIMATED COMPLETION DATE 7906	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE				
19. DATE/EFFECTIVE: D. NUMBER: E. TYPE: F. KIND OF AWARD:		EXPIRATION:	FISCAL YEAR	PREVIOUS CURRENT	G. PROFESSIONAL MAN YRS 0.1	H. FUNDS (in thousands) 07
			78	79	0.2	10
19. RESPONSIBLE DOD ORGANIZATION						
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701						
20. PERFORMING ORGANIZATION						
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701						
PRINCIPAL INVESTIGATOR (Printed name if U.S. Academy participating)						
NAME* Salisbury, L.L. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER						
ASSOCIATE INVESTIGATORS						
NAME* POC:DA						
22. KEYWORD (Printed each with Security Classification Code) (U) Whole Body; (U) Diagnostic; (U) X-Ray; (U) Scanner; (U) Flying Spot; (U) Field Medicine; (U) Field Equipment						
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Printed individual paragraphs identified by number. Print in full each with Security Classification Code.)						
23. (U) To provide engineering assistance in evaluating new diagnostic X-ray scanners being evolved for military field use.						
24. (U) Professionally evaluate and assess new equipment as required.						
25. (U) 7710 - 7809. The digital version has been installed in the University of Maryland Shock Trauma Unit for clinical evaluation. Problems have been encountered with the tape transport and computer which limited the number of patients processed on the system. This problem appears to have been solved and it is anticipated that during the 1st Quarter of FY79 a statistically significant number and types of patients will have been processed.						
90						
99						
*Available to contractors upon contractor's approval.						

DETAIL SHEET

TITLE: Whole Body Diagnostic X-Ray Scanner

WORK UNIT NO: 016

AGENCY ACCESSION NO: DA OB 6172

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

This task was established on 30 January 1976. The objective is to provide engineering assistance for the evaluation and assessment of a new diagnostic X-Ray scanner being developed for Military Field use by American Science and Engineering, Inc., of Cambridge, MA.

The system provides radiographic images by using a 1 mm diameter beam and scanning the area of interest. The beam is detected by a highly efficient crystal and digitized. The information is processed digitally and presented on a cathode ray screen and/or stored on a magnetic media. This technique reduces patient radiation dose to less than 1 mr and provides 1024 gray levels. To obtain this amount of information with a conventional system would require multi-exposures at different techniques.

PROGRESS

A breadboard prototype has been installed in the Shock-Trauma Unit of the University of Maryland Hospital in Baltimore, Maryland. The type of injuries and peak patient load at the Shock-Trauma unit approximates the combat situation as closely as is possible during peace time.

Much time was lost due to soft ware and hardware unreliability. These problems have been solved and patient thru put is now satisfactory. It is expected to terminate the clinical tests in 1st Qtr FY 79. Preliminary results indicate professional acceptance of the results obtained.

REFERENCES

1. Letter, SGRD-UBE-G, dated 30 January 1976, subject: Whole Body Diagnostic X-Ray Scanner, Task No. A816.00.016.

2. Letter, SGRD-SDM, dated 17 February 1976, subject: Evaluation of Application for Support of Research.
3. Letter, SGRD-UBE-G, dated 3 March 1976, subject: Evaluation of Application for Support of Research Entitled, Development of a Whole Body Flying Spot X-Ray Medical Unit.
4. Letter, SGRD-SDM, dated 31 March 1976, subject: Evaluation of Application for Support of Research.
5. Letter, SGRD-UBE-G, dated 6 April 1976, subject: Evaluation of Addendum Material, submitted by investigator in Support of Research entitled, "Development of a Whole Body Flying Spot X-Ray Medical Unit".
6. Letter, SGRD-OPM, dated 29 June 1977, subject: Development/Clinical Evaluation of a Whole Body Flying Spot Medical X-Ray Unit.
7. Memorandum for Contract Review Board, SGRD-RM, dated 23 August 1977, subject: Minutes from Contract Review Board.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION [*]	2. DATE OF SUMMARY [*]	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY [*]	6. WORK SECURITY [*]	7. REGRADING [*]	8. DISSEM INSTN [*]	9. SPECIFIC DATA [*] CONTRACTOR ACCESS	10. LEVEL OF SUM A. WORK UNIT
78 05 01	H. TERMINATION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	DD-DR&E(AR)636
10. NO./CODES [*]	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	62778A	35162778A838		00		017 APC F788	
B. CONTRIBUTING	XXXXXX	CARDS 114f					
11. TITLE (Printed with security classification code)* (U) Mobile Battalion Aid/Clearing Stations, Engineering Evaluation of 002400 Bioengineering; 009800 Medical and Hospital Equipment							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS [*]							
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7704	7805		DA	C. In-House			
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS	
				FISCAL YEAR	78 CURRENT	0.1	02
				FISCAL YEAR	79 CURRENT	0.0	00
20. RESPONSIBLE DOD ORGANIZATION				21. PERFORMING ORGANIZATION			
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME Dettor, C.M., COL TELEPHONE (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (Printed name if U.S. Army/DoD institution) NAME Malek, J.W. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATOR NAME O'Connor, R.J. NAME POC:DA			
22. GENERAL USE Foreign Intelligence Not Applicable							
23. KEYWORD (Print each word with security classification code) (U) Battalion Aid Station; (U) Field; (U) Clearing Station; (U) Mobile; (U) Field Medical Stations							
24. TECHNICAL OBJECTIVE, 25. APPROACH, 26. PROGRESS (Printed individual paragraphs identified by number. Print or code each with security classification code.)							
23. (U) To evaluate suitability of the chassis and body of a Mobile Field Kitchen Trailer (MFKT) for transporting and utilization by the Battalion Aid Station and/or Clearing Station to provide assigned medical support in the Division Area of the Combat Zone.							
24. (U) Upon receipt of the MFKT, an engineering/packing study will be initiated to ascertain capability.							
25. (U) 7710 - 7804. Mobile Field Kitchen Trailer finally received end of March. Setups for the Battalion Aid Station (BAS) were initiated. Placement of the equipment for the BAS in an "in-service" layout and a "stowed" configuration indicated no serious volumetric problems. Task terminated by action of the Joint Working Group held 22 March 1978 as AHS will reconsider requirement as part of their mission pertaining to sets, kits, and outfits.							

DETAIL SHEET

TITLE: Mobile Battalion Aid/Clearing Station, Engineering Evaluation of

WORK UNIT NO: 017

AGENCY ACCESSION NO: DA OB 6217

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

It was desired that suitability of the chassis and body of a Mobile Field Kitchen Trailer (MFKT) for transporting existing field medical sets and utilization in an operational mode to provide assigned medical support in the Division Area of the Combat Zone.

PROGRESS

The mobile trailer was received and feasibility study initiated. Serious weight handling and volumetric capacity problems were indicated. The task was terminated at J.W.G. held on 22 March 78.

REFERENCES

1. Letter, SGRD-SDM, dated 4 February 1977.
2. Letter, SGRD-UBE-G, dated 14 March 1977.
3. Letter, SGRD-SDM, dated 18 March 1977.
4. 1st Ind, SGRD-SDM, dated 12 April 1977.
5. Letter, SGRD-UBE-G, dated 28 April 1977.
6. Letter, SGRD-OP, dated 20 April 1978, subject: Recommendations/Decisions of JWG, 22 March 78.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL DD-DR&E(AR)636	
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY ⁴ U	6. WORK SECURITY ⁵ U	7. REGRADING ⁶ NA	8. DISBN INSTRN ⁷ NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM- A. WORK UNIT
10. NO./CODES ⁸ A. PRIMARY XXXXXX	PROGRAM ELEMENT 62778A	PROJECT NUMBER 3S162778A8 38		TASK AREA NUMBER 00	WORK UNIT NUMBER 018 APC F789		
11. TITLE (Puruse each with Security Classification Code) (U) Personnel Decontamination Sets, Design of							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁹ 002400 Bioengineering; 009800 Medical and Hospital Equipment							
13. START DATE 7704	14. ESTIMATED COMPLETION DATE 8011		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE FISCAL YEAR 78 CURRENT 79		19. PROFESSIONAL MAN YRS 0.3 0.0	20. FUNDS (in thousands) 15 00		
21. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		22. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		23. KEYWORD (Puruse each with Security Classification Code) (U) Chemical Decontamination; (U) Field Equipment; (U) Personnel Decontamination; (U) Decontamination			
24. GENERAL USE Foreign Intelligence Not Applicable		25. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Puruse individual paragraphs identified by number. Puruse text of each with Security Classification Code.) 23. (U) To develop personnel decontamination sets for use by the US Army Biomedical Laboratory, Edgewood Arsenal, MD; one set for use in a fixed installation with the other unit developed for field use. 24. (U) Investigate and evaluate current decontamination practices and materials. Design, fabricate and test sets based on the data accrued from the evaluation. 25. (U) 7710 - 7809. Study was initiated and additional information was requested from USAMRDC in order to establish design parameters.		PRINCIPAL INVESTIGATOR (Puruse each with Security Classification Code) NAME: Cranford, H.B. TELEPHONE: (301) 663-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Patzer, N.H. NAME: POC: DA			
* Available to contractors upon contractor's request.							

DETAIL SHEET

TITLE: Personnel Decontamination Sets, Design of

WORK UNIT NO: 018

AGENCY ACCESSION NO: DA OB 6218

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

USAMBRDL has been tasked to design and build equipment to: (a) decontaminate chemically contaminated personnel in the Toxic Exposure Aid Station (TEAS) at the Biomedical Laboratory, Aberdeen Proving Grounds, Maryland; and (b) decontaminate personnel on site prior to transport to the TEAS. Additional discussions with the Biomedical Laboratory, USAMBRDL and SGRD-OPM, indicate with the experience gained in accomplishment of (a) and (b), USAMBRDL shall build an experimental system to decontaminate casualties prior to admission to field medical facilities. The initial problem statement did not provide sufficient technical information to establish equipment design parameters. Initial coordination has done more toward identifying problem areas than arriving at potential solution. An outline of problem areas has been developed. Contact has been established with the Biomedical Laboratory and Chemical Systems Laboratory at APG, as well as the Navy and Air Force, to provide technical information and potential solutions. The Naval Research Laboratory provided information on the Navy Ash/Slash study for shipboard biological and chemical decontamination.

Information made available by the Biomedical Laboratory and the Chemical Systems Laboratory, APG, was insufficient to establish design parameters.

PROGRESS

Specific information was requested from USAMRDC necessary to establish design parameters. The Joint Working Group recommended continued development with technology gained from development work for USAF, used to establish requirements.

REFERENCES

1. Letter, SGRD-SDM, USAMRDC, dated 15 March 1977, subject: Construc-

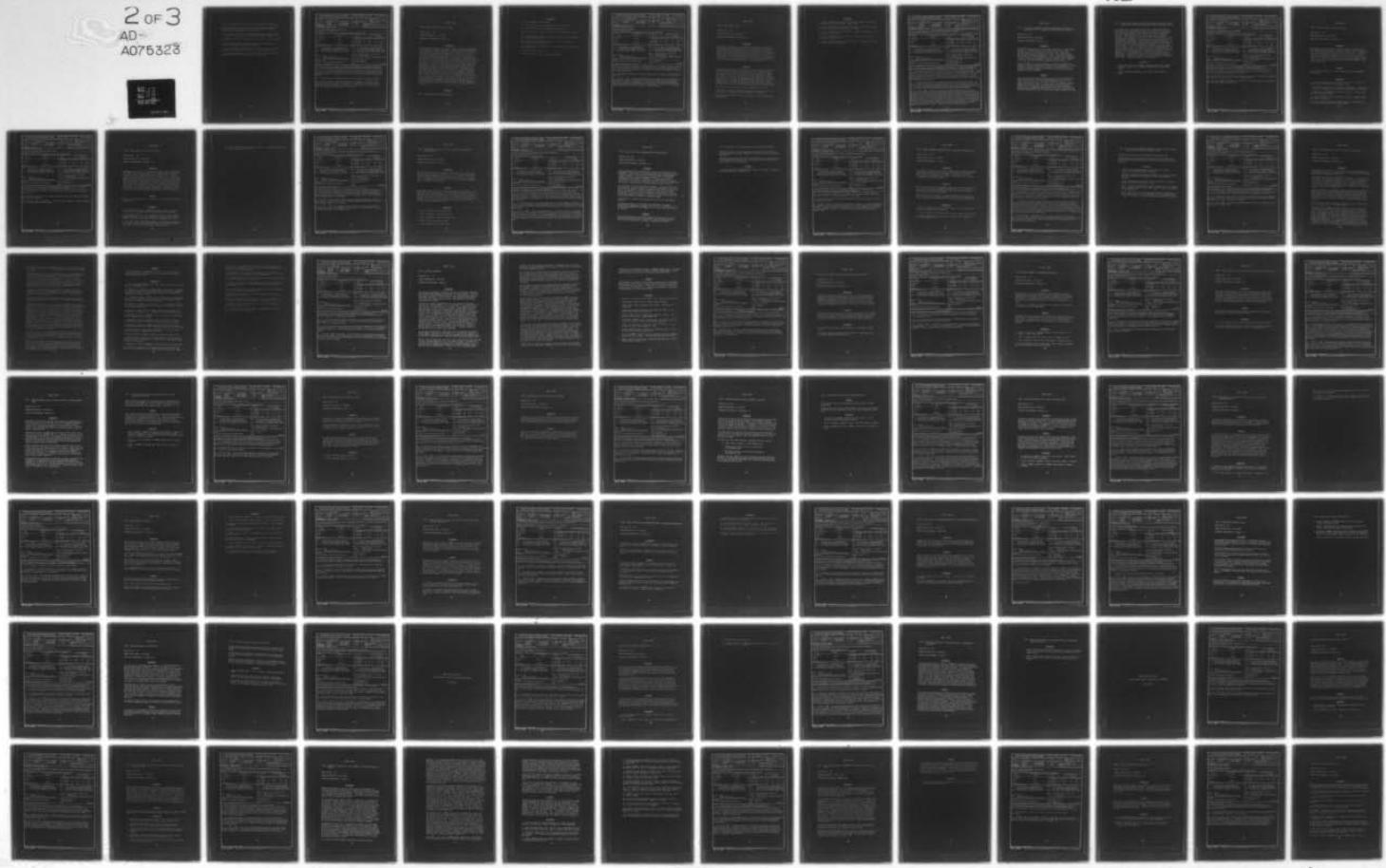
AD-A075 323

ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT --ETC F/G 6/5
US ARMY MEDICAL RESEARCH AND DEVELOPMENT REPORT. (U)
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tion of Decontamination Units for the U.S. Army Biomedical Laboratory.

2. Letter, DROAR-CLL-M, 10 May 1977, 1st Ind., Biomedical Laboratory, Edgewood Arsenal, MD, subject: Patient Decontamination for Medical Facilities, Task No. A838.00.018, 9 June 1977.
3. Trip Report, 20 July 1977, to Edgewood Arsenal, MD, subject: To discuss the state-of-the-art of Personnel Decontamination, 3 August 1977.
4. USAMBRDL, "Personnel Decontamination Problem Outline", dated 16 August 1977.
5. Memorandum for Record, USAMBRDL, SGRD-UBH-O, 14 September 1977, subject: Decontamination of Chemical Casualties.
6. Letter, SGRD-UBE-G, USAMBRDL, dated 8 Dec 1977, subject: Personnel Decontamination, Request for Information of Task No. 838.00.018.
7. Letter, SGRD-OP, USAMRDC, dated 20 April 1978, subject: Recommendations/Decisions of Joint Working Group, 22 March 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ¹	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY 78 05 01	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY ACTY ³ U	6. WORK SECURITY ⁴ U	7. REGRADING ⁵ NA	8. DA DISSEM INSTRNM NL	9. SPECIFIC DATA ⁶ CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
				10. NO. (CODES) ⁷ PROGRAM ELEMENT	PROJECT NUMBER	11. LEVEL OF SUM A. WORK UNIT
				62778A	3S162778A838	WORK UNIT NUMBER 019 APC F712
				62110A	3A162110A816	00
				CARDS 114f		019
12. TITLE (Provide with Security Classification Code) (U) Dental Field Area Support System						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁸ 009800 Medical and Hospital Equipment; 002400 Bioengineering						
14. START DATE 6912	15. ESTIMATED COMPLETION DATE CONT	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRAANT	19. RESOURCES ESTIMATE EXPIRATION	20. PROFESSIONAL MAN-YRS	21. FUNDS (in thousands)			
A. DATE/EFFECTIVE:	FISCAL 78 YEAR 79	0.1	05			
B. NUMBER: C. TYPE:	CURRENT	0.0	00			
D. KIND OF AWARD:	E. AMOUNT: F. CUM. AMT.:					
22. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701	23. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434	PRINCIPAL INVESTIGATOR (FUNDING AGENT IF U.S. GOVERNMENT) NAME: Malek, J.W. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:					
24. GENERAL USE Foreign Intelligence Not Applicable	ASSOCIATE INVESTIGATORS NAME: Prensky, W.C. NAME: POC:DA					
25. KEYWORD (Provide each with Security Classification Code) (U) Dental Field Equipment; (U) Dental Field Units; (U) Dental Portable Equipment; (U) Dental Field Systems; (U) Dental Field Support						
EX. TECHNICAL OBJECTIVE, ⁹ EX. APPROACH, EX. PROGRESS (Provide individual paragraphs identified by number. Provide text of each with Security Classification Code.)						
23. (U) To clinically evaluate the evolving new generation of field dental equipment prototypes, within the concept of mutually supporting and complementary field treatment systems, and compatible with the current TO&E and standard field shelter systems.						
24. (U) Assemble the necessary materiel and personnel and clinically evaluate.						
25. (U) 7710 - 7804. Clinical evaluation of an automatic field dental X-ray processor is being conducted. If evaluation is successful, a new task will be initiated for a more thorough assessment. Task terminated by action of formal special In-Process Review (IPR) held 21 March 1978.						

DETAIL SHEET

TITLE: Dental Field Area Support System

WORK UNIT NO: 019

AGENCY ACCESSION NO: DA OA 6250

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

This task was initiated to clinically evaluate evolving new generations of field dental equipment, employment of some in the field environment, and compatibility of this equipment with the Army Shelter System in which it would most generally be employed. First such evaluation was conducted during February-March 1970 at Fort Sam Houston, Texas, in which several items of new generation of field dental equipment were evaluated within the MUST inflatable Shelter element. The combat field environment was only simulated in this assessment as the shelter element was erected and used on a hard stand surface on the Main Post at Fort Sam Houston. A reasonable compatibility of shelter and equipment was indicated. In April 1971, a Military Potential Test (MPT) commenced in USAREUR to evaluate two field dental operating assemblages. This evaluation was unique in that the equipment was to be transported by conventional Army carriers to a variety of remote troop locations where there was a need for dental support, and to be utilized in a variety of non-specific shelters by periodically changing operator/assistant teams. Then, for the first time, the dental equipment prototypes were receiving an evaluation wherein both use and abuse are factors and wherein a real measure of long term reliability and durability, in every shelter and support environment, were addressed. Adequate data were collected from this evaluation to establish basis for new programs for final modification and type classification action for new portable dental units.

PROGRESS

None. Task Terminated by JWG, March 1978.

REFERENCES

1. D/F, SGRD-SDM, 5 December 1969.
2. Clinical Evaluation, Fort Sam Houston, Texas, March 1970.
3. Military Potential Test, USAREUR, February-May 1971.
4. Military Potential Test, Fort Jackson, S.C., November 1972-January 1973.
5. User Evaluation of Dental Operating and Treatment Units, Comparison Test, USAIDR, December 1974.
6. Establishment of Task A838.00.039, 15 July 1975, to Develop a Field Utility Unit for Dental use.
7. Establishment of Task A838.00.015, 1 October 1976, to develop a New Field Dental Chair.
8. Minutes of JWG, 22 March 1978.
9. Letter, SGRD-UBE, 22 May 1978, Terminating Task.

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RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL DD-DR&E(AR)876	
3. DATE PREV SUMM#	4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	DA 0B 6209	78 10 01		
78 07 01	H. TERMINAT	ON U	U	NA	NL	7. REGARDING	
10. NO /CODES*				8. DIA/BIN INSTRN		8. SPECIFIC DATA	
A. PRIMARY				NL		CONTRACTOR ACCESS	
B. CONTRIBUTING						<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
C. CARRIED OVER						9. LEVEL OF SUMMARY	
CARDS 114f						A. WORK UNIT	
11. TITLE (Provide with security classification Code)* (U) Field Medical Gurney				12. SCIENTIFIC AND TECHNOLOGICAL AREA* 002400 Bioengineering; 009800 Medical and Hospital Equipment			
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD	
7701		7807		DA		C. In-House	
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE			
A. DATES/EFFECTIVE:				PRECEDING		B. PROFESSIONAL MAN HRS	
B. NUMBER*				FISCAL YEAR		C. FUNDS (in thousands)	
C. TYPE:				78		0.1	
D. AMOUNT:				CURRENT		04	
E. CUM. AMT.:				79		0.1	
F. CUM. AMT.:						00	
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION			
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNISH SCRTY IF U.S. GOVERNMENT INVOLVED) NAME: O'Connor, R.J. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Patzer, N.H. NAME:			
21. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
22. KEYWORDS (Provide each with security classification Code)* (U) Field; (U) Medical Equipment; (U) Wheeled Litter; (U) Gurney; (U) Medical Gurney							
23. TECHNICAL OBJECTIVE* 24. APPROACH* 25. PROGRESS (Provide individual paragraphs identified by number. Precede text of each with security classification Code)*							
23. (U) To design and fabricate a field medical gurney for the movement of patients over semi-rough terrain.							
24. (U) Design, fabricate and evaluate a gurney which will meet the requirements of field use.							
25. (U) 7710 - 7806. Alternative approaches for the design of a field gurney were submitted for review. A prototype unit, using "Grass Skis" for movement, was fabricated. Project was reviewed by a Joint Working Group (JWG) and suspended pending review by the Academy of Health Sciences (AHS). Review by AHS recommended that development effort be discontinued. Task terminated.							

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DD FORM 1498

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65
AND 1498-1, 1 MAR 66 (FOR ARMY USE) ARE OBSOLETE.

9 M-5 GPO 1974-340-843/843

DETAIL SHEET

TITLE: Field Medical Gurney

WORK UNIT NO: 020

AGENCY ACCESSION NO: DA OB 6209

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

This task was established as one of the items listed in the Outline Development Concept Plan of 27 May 1976. The object of the work unit was to develop a gurney type platform for the movement of patients within field medical facilities over semi-rough terrain. The constraints placed on such a platform included; ease of operation by one person; lightweight construction capable of supporting the 95th percentile man; collapsibility for storage and shipment; maintainability at the user level; capable for accepting patients on the U.S. Army Standard Litter; and the possession of permanent straps for patient security.

PROGRESS

A feasibility study which considered the constraints was conducted and three alternative approaches were presented for consideration. The first was to product improve a standard wheeled stretcher by changing its wheels to allow easier movement in the field medical environment. The second was to restudy the "Rollagon" concept identified in earlier work done by the U.S. Army Medical Equipment R&D Laboratory. The third alternative was to develop a lightweight carrier with wheels similar to those found on all terrain vehicles, which would interface with the standard litter. A fourth alternative which was described subsequently utilized "Grass Skis"^(R) as a method of movement of the standard litter.

The results of the feasibility study were submitted for review.

A prototype unit using the "Grass Skis" was built and subjected to informal testing. Photographs were forwarded for information.

This task was terminated as a result of action by a Joint Working Group in March 1978.

REFERENCES

1. Letter, SGRD-SDH, dated 22 Dec 1976, subject, "Feasibility Study of Items from the Outline Development Concept Plan".
2. Letter, SGRD-UBE-G, dated 18 Jan 1977, subject: "Feasibility Study of Items from the Outline Development Concept Plan".
3. Letter, SGRD-UBE-G, dated 21 Mar 1977, subject, "Field Medical Gurney, Task No. 838.00.020".
4. Letter, SGRD-UBE-G, dated 12 Oct 1977, subject, "Field Medical Gurney, Task No. 838.00.020".
5. Letter, SGRD-OP, dated 22 June 1978, subject: Termination of Project, Field Medical Gurney, 838.00.020.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY	6. WORK SECURITY	DA 0B 6176	78 10 01	DD-DR&E(AR)636
77 10 01	K. COMPLETION	U	U	NA	NL	
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	62778A	3S162778A838	00	021 APC F764		
B. CONTRIBUTING	62110A	3A162110A816	00	021		
C. CARDS 114f						
11. TITLE (Provide with Security Classification Code) (U) Evaluation of Potential Hazards Associated with the Use of Root-Lowell Pro-ULV Portable Insecticide Aerosol Generator						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 005900 Environmental Biology; 016800 Toxicology						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7604	7806	DA	C. In-House			
17. CONTRACT/GANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUND (in thousands)
A. DATES/EFFECTIVE:				FISCAL YEAR	78	0.1
B. NUMBER:				CURRENT	79	0.0
C. TYPE:						01
D. KIND OF AWARD:						00
18. RESPONSIBLE DOD ORGANIZATION				21. PERFORMING ORGANIZATION		
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUALS				PRINCIPAL INVESTIGATOR / PUNIC MAN / U.S. AUTHORITY INVESTIGATOR		
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				NAME: Nelson, J.H. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER:		
22. GENERAL USE				ASSOCIATE INVESTIGATORS		
Foreign Intelligence Not Applicable				NAME: Desrosiers, R.E. NAME: Gula, P.R.		
POC:DA						
23. KEYWORD (Provide each with Security Classification Code) (U) Root-Lowell Pro-ULV; (U) Insecticide Aerosol Generator; (U) Ultra Low Volume (ULV) Dispersal; (U) Toxicity; (U) Droplet Size Spectrum						
24. TECHNICAL OBJECTIVE, 25. APPROACH, 26. PROGRESS (Provide individual paragraphs identified by number. Provide each with Security Classification Code)						
23. (U) Following the use of the Pro-ULV Portable Insecticide Aerosol Generator, pest controllers have complained of headaches and nausea. It is suspected that due to the design of the equipment, the spectrum of insecticide particles produced is too small to be effectively filtered out by currently used respiratory protective equipment. The spectrum of particle sizes produced will be determined and related to the toxicity of the insecticide being used.						
24. (U) To determine droplet size spectrum produced by the Root-Lowell Model 1035, Pro ^R ULV Portable Insecticide Aerosol Generator, utilizing a Royco Model 225 particle size analyzer. The spectrum produced by the generator will be related to the toxicity of the insecticide routinely used (MGK pyrocide fogging concentrate 5628).						
25. (U) 7710 - 7809. The pesticide droplet spectrum produced by the Pro-ULV was determined. Evaluation of several respiratory devices used in conjunction with the operation of the ULV generator indicated that the NIOSH approved pesticide cartridges were more efficient than the unapproved cartridges in filtering out droplets smaller than 4.8 microns. All tested cartridges were equally effective in filtering droplets larger than 4.8 microns. A toxicological evaluation of the pesticide indicated some problems with the components, however none of the problems are major if the compound is used in accordance with manufacturer's labeling requirements and using NIOSH approved respirator cartridges. A technical report is being prepared.						

DETAIL SHEET

TITLE: Evaluation of Potential Hazards Associated With the Use of Root-Lowell Pro(R) ULV Portable Insecticide Aerosol Generator.

WORK UNIT NO: 021

AGENCY ACCESSION NO: DA OB 6176

PRINCIPAL INVESTIGATOR: Nelson, J. H.

BACKGROUND

The Pro(R) ULV Portable Insecticide Aerosol Generator is a non-standard item which is currently being used extensively in military pest control operations. Following use of the equipment, pest control operators have suffered headaches and nausea. This research project was therefore initiated to determine if these problems were resulting from the design of the equipment wherein a great many small insecticide droplets were being produced which could not be effectively filtered out by the respiratory protective equipment currently in use.

A Royco(R) Model 225 Particle Counter was utilized to determine the spectrum of insecticide droplets produced by the ULV generator. Several respiratory devices currently being used by military pest control operators have been evaluated for efficiency in removing the droplets produced by the ULV generator.

PROGRESS

The pesticide droplet spectrum produced by the Pro-ULV was determined. Seventy-four percent of the droplets produced were 0.5 to 2.0 μ in size; 23% were in the 2.0 - 4.8 μ range; 2.5% were in the 4.8 - 7.5 μ range; and 0.4% were in the 7.5 - 20.0 μ range. There were no droplets greater than 20.0 μ detected. Evaluations of several respiratory devices used in conjunction with the operation of the ULV generator indicated that the NIOSH approved pesticide filters were more efficient than the nonapproved filters in screening out droplets smaller than 4.8 μ .

TITLE: Evaluation of Potential Hazards Associated with the Use of Root-Lowell Pro(R) ULV Portable Insecticide Aerosol Generator (Cont'd)

All tested filters were equally effective in screening out droplets larger than 4.8 μ . Transient toxic signs (red exudate around the eyes and nose) were observed in animals exposed to one of the components of the insecticide (APCO-467) for 1 hr at 4.7 mg/l, and for 4 hrs at 1.3 mg/l. These signs were also observed with another component (Pyrocide) after exposure of 4 hrs at 1.4 mg/l. No histological lesions attributable to inhalation of the Pyrocide fogging concentrate or its ingredients were detected in rats necropsied 14 days post exposure. The results of behavioral tests indicated that exposure to high concentrations (4.7 mg/l) of APCO 467 (deodorized kerosene) for 1 hr or lower concentrations (1.3 mg/l) for four hours impaired rat avoidance performance for almost 24 hrs. Pulmonary Function tests indicate possible transitory lung irritation in rabbits exposed to Pyrocide-175, APCO-467, and the total fogging concentrate. Data indicate the compound is non-mutagenic. It is recommended that the use of the pyrocide fogging concentrate be continued with the Pro-ULV aerosol generator following manufacturer's labeling requirements and using only NIOSH approved pesticide filters. A technical report is being prepared.

REFERENCES

1. Letter, ATEN-FE-BG, to HQDA(SGRD), dated 30 January 1976, subject: Potential Hazards in Use of PRO-ULV(R) Machine Due to Equipment Design.
2. Letter, SGRD-SDM to USAMBRDL, dated 10 March 1976, subject: as above.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				L. AGENCY ACCESSION ⁶	M. DATE OF SUMMARY ⁷	REPORT CONTROL SYMBOL			
8. DATE PREV SUMMARY 78 05 01	9. KIND OF SUMMARY H. TERMINATION	10. SUMMARY ACTY ⁸ U	11. WORK SECURITY ⁹ U	DA OB 6210	78 10 01	DD-DR&E(AR)636			
				12. REGADING ¹⁰	13. DISPTN INSTNM ¹¹	14. SPECIFIC DATA ¹²			
				NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
				15. LEVEL OF SUM	16. WORK UNIT				
				17. NO./CODES ¹³	PROGRAM ELEMENT		PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
				A. PRIMARY	62778A		3S162778A838	00	022 APC F784
				B. CONTRIBUTING	X000X000X000X		CARDS 114f		
				18. TITLE (Provide with Security Classification Code) (U) Trancrit, Emergency Medical Equipment					
				19. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment					
20. START DATE 7701		21. ESTIMATED COMPLETION DATE 7805		22. FUNDING AGENCY DA		23. PERFORMANCE METHOD C. In-House			
24. CONTRACT/GRAANT		25. EXPIRATION		26. RESOURCES ESTIMATE PROCEEDING		27. PROFESSIONAL MAN YRS 0.1			
28. DATES/EFFECTIVE:		29. EXPIRATION		FISCAL YEAR	77	28. FUNDS (In thousands) 05			
30. NUMBER:		31. AMOUNT:			78	32. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
33. TYPE:		34. CUM. AMT.:		35. PRINCIPAL INVESTIGATOR/PUNIC SPAN // U.S. ARMY MEDICAL BIOENGINEERING NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277 AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Stup, J.L.		36. FUND SOURCE NAME: POC:DA			
37. GENERAL USE Foreign Intelligence Not Applicable		38. KEYWORD (Provide back with Security Classification Code) (U) Ambulance; (U) Medical Transportation; (U) Medical Equipment; (U) Medical Telemetry; (U) Patient Monitoring		39. TECHNICAL OBJECTIVE, 40. APPROACH, 41. PROGRESS (Provide individual paragraphs identified by number. Provide text of each with Security Classification Code.)					
				23. (U) To develop a system for air/ground ambulances to monitor critically ill patients being transported from point to point.					
				24. (U) Design, fabricate and evaluate patient monitors to be operated by paramedical personnel in the evacuation of sick and injured patients.					
				25. (U) 7710 - 7804. No progress. This work unit was terminated per Joint Working Group held at USAMRDL 22 March 1978.					

DETAIL SHEET

TITLE: Trancrit, Emergency Medical Equipment

WORK UNIT NO: 022

AGENCY ACCESSION NO: DA OB 6210

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

This laboratory was requested to conduct a feasibility study on the requirements and limitations of providing emergency medical equipment for the monitoring of the severely disabled soldier and the telemetering of this data during evacuation from a tactical situation. Various aspects of the problem were addressed including duration of transport, stability of the patient, parameters to be monitored, equipment necessary to react to abnormal conditions monitored, implications of telemetering and training. A report was submitted to HQDA (SGRD-OPM) with options identified.

PROGRESS

This task was terminated at a Joint Working Group held at USAMBRDL, 22 March 1978.

REFERENCES

1. Letter, SGRD-SDM, dated 22 December 1976, subject: Feasibility Study of Items from the Outline Development Plan.
2. Trip Report, University of Maryland Shock Trauma Unit, 4 March 1977, L. Salisbury, USAMBRDL, subject: Emergency Transportation of Patients.
3. Meeting held at USAMBRDL, 10 March 1977, subject: Field Transportation of the Wounded Soldier.
4. Letter, SGRD-UBE-G, dated 17 March 1977, subject: TRANCRIT, Emergency Medical Equipment.
5. Letter, SGRD-OP, dated 20 April 1978, subject: Recommendations/Decision of Joint Working Group, 22 March 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION [*]	2. DATE OF SUMMARY [*]	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY [*]	6. WORK SECURITY [*]	7. REGRADING [*]	8. DISRPT INSTN [*]	9. SPECIFIC DATA-CONTRACTOR ACCESS
78 05 01	H. TERMINATION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. MO./CODES [*]	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	11. LEVEL OF SUM-A. WORK UNIT	
A. PRIMARY	62778A	3S162778A838		00	WORK UNIT NUMBER 023 APC F785	
B. CONTRIBUTING						
C. XXXXXXXXX	CARDS 114F					
12. TITLE (Provide each with security classification code) (U) Light, Surgical, Battalion Aid Station						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment						
14. START DATE	15. ESTIMATED COMPLETION DATE	16. FUNDING AGENCY		17. PERFORMANCE METHOD		
7701	7805	DA		C. In-House		
18. CONTRACT/GANT		19. RESOURCES ESTIMATE		20. PERFORMANCE METHOD		
A. DATES/EFFECTIVE:		B. PROFESSIONAL MAN-YRS		D. FUNDS (in thousands)		
EXPIRATION:		FISCAL	77	0.0	00	
C. TYPE:		YEAR	CURRENT			
E. CUM. AMT.			78	0.0	00	
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION		23. KEYWORD (Provide each with security classification code)		
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701		(U) Field Light; (U) Surgical Light; (U) Battalion Aid Station; (U) Field Surgery; (U) Field Medical Equipment		
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Provide name if U.S. Academic Institution) NAME: Cranford, H.B. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:		24. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Provide individual paragraphs identified by number. Provide each with security classification code.)		
25. GENERAL USE Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME: O'Connor, R.J. NAME: POC:DA		23. (U) To redesign and improve the standard surgical light used in the Battalion Aid Station.		
				24. (U) Review the deficiencies; redesign and fabricate a new light with stand and evaluate for acceptance.		
				25. (U) 7710 - 7804. No progress. Feasibility study completed. Project terminated by Joint Working Group 22 March 1978.		

DETAIL SHEET

TITLE: Light, Surgical, Battalion Aid Station

WORK UNIT NO: 023

AGENCY ACCESSION NO: DA OB 6211

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The purpose of the task is to redesign the surgical light (NSN-6530-00-299-8595). The task was established on 22 December 1976. Review of: (a) current surgical light drawings and specifications; (b) current surgical lighting recommendations; and (c) commercially available lights and technical literature, was initiated and alternate solutions to the problem evaluated. The alternate solutions were forwarded to HQDA (SGRD-SDM) for review and comment prior to the meeting of the Joint Working Group (JWG) during the week of 22 April 1977. Commercial and military lights under consideration as an alternate solution, were ordered and received prior to the JWG Meeting for examination and display. The JWG did not discuss the Surgical Light problem due to insufficient time. The list of alternative solutions was forwarded to AHS on 21 June 1977.

PROGRESS

None. At a JWG meeting held on 22 March 78 it was decided to terminate the work unit.

REFERENCES

1. MIL-SPEC, MIL-L-36189, 13 April 1964, "Light, Surgical, Bracket, Portable, Battery Operated", NSN 6530-00-299-8595, DPSC Dwg. 2009.
2. Department of the Army, U.S. Army Medical Research and Development Command, Washington, D.C., 20314, SGRD-SDM, 22 December 1976, subject: Feasibility Study of Items from the Outline Development Concept Plan.
3. U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, 9 March 1977, subject: Light, Surgical, Battalion Aid Station, Feasibility Study.

4. Letter, SGRD-OP, dated 20 April 78, subject: Recommendations/Decisions
of Joint Working Group, 22 March 78.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
				DA 08 6212	78 10 01	DD-DR&E(AR)636
3. DATE PREV SURVEY	4. KIND OF SURVEY	5. SUMMARY SCITY ⁴	6. WORK SECURITY ⁵	7. REGRADING ⁶	8. DESIGN INSTRN	9. SPECIFIC DATA ⁷
73 05 01	H. TERMINATION	U	U	NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	62778A	3S162778A838		00	024 APC F790	
B. CONTRIBUTING						
XXXXXX	CARDS 114f					
11. TITLE (Provide each with Security Classification Code) (U) X-Ray Apparatus, Dental, Portable (NSN 6525-00-690-3214), Modification of						
12. SCIENTIFIC AND TECHNOLOGICAL AREA ⁹ 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7704	7905	DA	C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		
A. DATES/EFFECTIVE:		B. PREVIOUS		C. FUNDS (in thousands)		
B. NUMBER ¹⁰		FISCAL YEAR	78	0.1	02	
C. TYPE ¹¹		CURRENT	79	0.0	00	
D. KIND OF AWARD ¹²		E. CUM. AMT.	F. PERFORMING ORGANIZATION			
19. RESPONSIBLE DOD ORGANIZATION			NAME ¹³ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁴ Fort Detrick, Frederick, MD 21701			
NAME ¹⁵ Dettor, C.M., COL TELEPHONE ¹⁶ (301) 663-2434; AUTOVON 343-2434			NAME ¹⁷ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁸ Fort Detrick, Frederick, MD 21701			
20. GENERAL USE ¹⁹		PRINCIPAL INVESTIGATOR (PURCHASED FROM U.S. Academic Institution) NAME ²⁰ Malek, J.W. TELEPHONE ²¹ (301) 663-7277 SOCIAL SECURITY ACCOUNT NUMBER ²²			POC:DA	
Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME ²³				
22. KEYWORD (Provide each with Security Classification Code) (U) X-Ray; (U) Dental X-Ray; (U) Field X-Ray; (U) Portable X-Ray						
23. TECHNICAL OBJECTIVE ²⁴ ; 24. APPROACH, 25. PROGRESS (Punctuate individual paragraphs identified by number. Proceed text of each with Security Classification Code) 23. (U) As directed by DASG-R0-D, redesign the internal packaging configuration of the field container of subject item to accommodate newly available tubehead and timer/voltage compensator components which will upgrade subject item to comply with revised standards for X-ray equipment.						
24. (U) Obtain new tubehead and timer/voltage compensator components from the manufacturer and redesign the internal packaging configuration of the field chest to receive these components and evaluate.						
25. (U) 7710 ~ 7804. On 28 December 1977, a drawing package with related bill of material was forwarded to USAMRDC for distribution. Task terminated by action of Joint Working Group held 22 March 1978.						

DETAIL SHEET

TITLE: X-Ray Apparatus, Dental, Portable (NSN 6525-00-690-3214),
Modification of

WORK UNIT NO: 024

AGENCY ACCESSION NO: DA OB 6212

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

With the introduction of new standards for X-Rays, the current field Dental X-Ray Unit was not acceptable for use. The manufacturer (North American Phillips Company) has redesigned a new tubehead, collimator and line compensator/timer combination, which will meet the new standards. Prototypes were received in July and redesign of the shipping/support container was initiated.

PROGRESS

The internal structure of the case was redesigned and fabricated. Every effort was made to salvage as much of the original case and internal supports. With careful redesign, at least 95% of the original container was saved and re-utilized after logistical evaluation and acceptance. Drawings detailing the container modifications were prepared and forwarded to MRDC. At the JWG in March 1978, it was decided not to proceed in this decision and terminate the task.

REFERENCES

1. Letter, SGRD-SDD, dated 29 March 1977.
2. Letter, SGRD-UBE-G, dated 28 April 1977.
3. Letter, SGRD-UBE-G, dated 28 December 1977.
4. Minutes of JWG, dated 30 Mar 1978.
5. Letter, SGRD-UBE, dated 22 May 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ¹	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL	
3. DATE PREV SURVEY	4. KIND OF SUMMARY	5. SUMMARY SCITY ³	6. WORK SECURITY ⁴	7. REGADING ⁵	8. DISIN INSTN ⁶	9. SPECIFIC DATA-CONTRACTOR ACCESS ⁷	10. LEVEL OF SUM- A. WORK UNIT
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO /CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	62778A	3S162778A838		00	025 APC F786		
B. CONTRIBUTING	XXXXXX0000XX	CARDS 114F					
11. TITLE (Print in full with Security Classification Code) (U) Evaluation of Rapid Non-Destructive Insect Detector							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 002600 Biology							
13. START DATE	7703	14. ESTIMATED COMPLETION DATE	7909	15. FUNDING AGENCY	DA	16. PERFORMANCE METHOD	C. In-House
17. CONTRACT/GANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (in thousands)	
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PRECEDING	0.4	26		
B. NUMBER:		CURRENT	78	0.9	35		
C. TYPE:	D. AMOUNT:						
E. CUM. AMT.	F. CUM. AMT.						
21. RESPONSIBLE DOD ORGANIZATION				22. PERFORMING ORGANIZATION			
NAME ¹⁰ : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹¹ : Fort Detrick, Frederick, MD 21701				NAME ¹⁰ : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹¹ : Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PRINT NAME IF U.S. GOVERNMENT SPONSORED) NAME: Kardatzke, J.T. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Salisbury, L.L. NAME: Schiefer, B.A.			
23. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
24. KEYWORD (Print each with Security Classification Code) (U) Pest Control; (U) Insect Detector; (U) Stored Products; (U) Commodities; (U) Insect Surveillance							
25. TECHNICAL OBJECTIVE ¹² ; 26. APPROACH; 27. PROGRESS (Print individual paragraphs identified by number. Print last of each with Security Classification Code)							
23. (U) To conduct evaluation of the Rapid Non-Destructive Insect Detector System developed at the U.S. Department of Agriculture, Agricultural Research Service, Stored Products Laboratory, Savannah, Georgia. This detector was developed under a research contract awarded by the Headquarters, US Army Medical Research and Development Command Washington, DC.							
24. (U) Test protocols will be developed and actual field evaluations will be conducted in US Army commodity storage warehouses to ensure that the Rapid Non-Destructive Insect Detector will effectively detect stored-products insect infestations in stored commodities.							
25. (U) 7710 - 7809. The first prototype detector has been evaluated. This prototype did not meet the standards required in the protocol. Consistent and repeatable results could not be obtained. An in-house memorandum report was prepared. The prototype has been on loan since February 1978 to FDA for their evaluation. Delivery of a second prototype has been delayed until November 1978 due to technical problems at USDA.							

DETAIL SHEET

TITLE: Evaluation of Rapid Non-Destructive Insect Detector

WORK UNIT NO: 025

AGENCY ACCESSION NO: DA OB 6213

PRINCIPAL INVESTIGATOR: Kardatzke, J.T.

BACKGROUND

A Rapid Non-Destructive Insect Detector System was developed by the US Department of Agriculture, Stored Products Laboratory, Savannah, GA under a research contract with the US Army Medical Research and Development Command (USAMRDC). At the direction of USAMRDC, the US Army Medical Bioengineering R&D Laboratory (USAMBRDL) initiated a work unit to coordinate a test program in cooperation with Defense Personnel Supply Center (DPSC) and the Food and Drug Administration (FDA) to test the system and insure its reproducibility and attainment of realistic results.

One prototype unit has been provided to USAMBRDL. Equipment testing has been completed. Several technical problems were encountered in the system. Failure of the machine to maintain a constant vacuum for a sustained period, development of an insect infestation in the interior lines of the machine, and poor sealing and placement of the vent ports in the bag system have slowed the evaluation. Conclusion of this test was that the first prototype was not suitable for designed purpose.

Prototype one is currently being evaluated by the Food and Drug Administration.

An advanced prototype is being prepared by personnel at the USDA, Stored Products Laboratory, Savannah, GA. This unit is scheduled to be delivered to USAMBRDL during November, 1978. At that time, this unit will be evaluated.

PROGRESS

Preliminary evaluations at this time indicate that the initial unit has little operational value due to operational time requirements and the difficulty in ascertaining if low level infestations are present.

TITLE: Evaluation of Rapid Non-Destructive Insect Detector (Cont'd)

Recommend that this work unit should be maintained in the 838 RDTE program and expanded to evaluate commercially available units and alternative approaches.

Recommend that the new unit should be evaluated in-house in accordance with the abbreviated test protocol and if found acceptable, be taken into a DPSC warehouse for field evaluation.

REFERENCE

1. Letter, SGRD-SDM to USAMBRDL, dated 7 March 1977, subject: Testing of Rapid Non-Destructive Insect Detector.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION [*]	2. DATE OF SUMMARY [*]	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY [*]	6. WORK SECURITY [*]	DA OB 6221	78 10 01	DD-DR&E(AR)636
78 05 01	H. TERMINATION	U	U	NA	NL	7. REGRADING [*] <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
8. NO./CODES [*] PROGRAM ELEMENT PROJECT NUMBER				9. TASK AREA NUMBER		10. LEVEL OF SUM A. WORK UNIT
A. PRIMARY	62778A	35162778A838		00	026 APC F792	
B. CONTRIBUTING						
<XXXXXX> CARDS 114f						
11. TITLE (Prelude with Security Classification Code) (U) Vacuum Stretcher Immobilizer (VSI), Engineering Evaluation of						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS [*] 002400 Bioengineering; 009800 Medical and Hospital Equipment						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7706	7805	DA		C. In-House		
17. CONTRACT/GANT				18. RESOURCES ESTIMATE		
A. DATES/EFFECTIVE:	EXPIRATION:	1990-1992		20. PROFESSIONAL MAN YRS		21. FUNDS (in thousands)
B. NUMBER:		FISCAL YEAR	78	0.1	01	
C. TYPE:	D. AMOUNT:	CURRENT	79	0.0	00	
E. KIND OF AWARD:	F. CUM. AMT.					
19. RESPONSIBLE DOO ORGANIZATION				20. PERFORMING ORGANIZATION		
NAME: US Army Medical Bioengineering Research & Development Laboratory				NAME: US Army Medical Bioengineering Research & Development Laboratory		
ADDRESS: Fort Detrick, Frederick, MD 21701				ADDRESS: Fort Detrick, Frederick, MD 21701		
PRINCIPAL INVESTIGATOR (Prelude each with Security Classification Code) NAME: O'Connor, R.J.						
TELEPHONE: (301) 663-7277; AUTOVON 343-7277						
SOCIAL SECURITY ACCOUNT NUMBER:						
ASSOCIATE INVESTIGATORS NAME: Cranford, H.B. NAME: POC:DA						
22. KEYWORD (Prelude each with Security Classification Code) (U) Field; (U) Body Splint; (U) Body Cast; (U) Vacuum Stretcher Immobilizer; (U) Medical Equipment						
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Prelude individual paragraphs identified by number. Prelude each with Security Classification Code.)						
23. (U) To evaluate a commercially available vacuum operated patient immobilizer stretcher (VSI) for use in moving patients in rear areas.						
24. (U) Procure VSI units for test and determine its suitability for use in field Army medical facilities.						
25. (U) 7710 - 7804. VSI units were received for evaluation. A proposed engineering evaluation plan was prepared and submitted for review and approval. Approval of the plan was postponed pending the decision of a Joint Working Group (JWG) regarding project status. Decision to terminate the project was made by the JWG on 22 March 1978.						

DETAIL SHEET

TITLE: Vacuum Stretcher Immobilizer (VSI), Engineering Evaluation of

WORK UNIT NO: 026

AGENCY ACCESSION NO: DA OB 6221

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

As a result of information supplied to USAMBRDL by Dr. Goldman of USARIEM and subsequent review of this information by USAMBRDL, the Academy of Health Sciences, and Headquarters USAMRDC, the following action was taken. Two of the Sohngen Vacuum Stretcher Immobilizers were procured by USAMBRDL for engineering evaluation.

PROGRESS

The VSI units were given a preliminary inspection and obvious deficiencies were noted and recorded in USAMBRDL notebook number 617. A report by the Army of the German Federal Republic (GFR) on a group of VSI units by various manufacturers was reviewed.

After review of the GFR report, a proposed engineering evaluation plan for the VSI units was prepared and submitted for approval. Termination of this work unit was recommended by a Joint Working Group in March 1978.

REFERENCES

1. Letter, SGRD-RO-D, dated 26 May 1977, subject: Vacuum Immobilized Stretcher Information, with inclosures.
2. Letter, SGRD-UBE-G, dated 6 Feb 1978, subject as above, with inclosure.
3. Proposed Engineering Evaluation Plan, Vacuum Stretcher Immobilizer (VSI), dated January 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY*	6. WORK SECURITY*	DA OA 6296	78 10 01	DD-DR&E(AR)636	
77 10 01	D. CHANGE	U	U	NA	NL		
7. REGRADING*				8. DATA INSTRN	9. SPECIFIC DATA CONTRACTOR ACCESS	10. LEVEL OF SUM	
					<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT	
10. MO./CODES*		PROGRAM ELEMENT		PROJECT NUMBER	TASK AREA NUMBER		WORK UNIT NUMBER
A. PRIMARY		62778A		3S162778A838	00		027 APC F742
B. CONTRIBUTING		62110A		3A162110A816	00		027
XXXXXX		CARDS 114f					
11. TITLE (Provide with Security Classification Code)* (U) Evaluation of Skid Mounted and Special Purpose Ultra Low Volume (ULV) Pesticide Dispersal Equipment							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD		
7503		CONT		DA	C. In-House		
17. CONTRACT/GANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS	20. FUNDS (In thousands)		
A. DATES/EFFECTIVE:		EXPIRATION:		FISCAL YEAR	78	0.7	43
B. NUMBER:		C. AMOUNT:		CURRENT	79	1.7	48
D. TYPE:		E. CUM. AMT.:					
F. KIND OF AWARD:							
19. RESPONSIBLE DOO ORGANIZATION		NAME: US Army Medical Bioengineering Research & Development Laboratory		NAME: US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS: Fort Detrick, Frederick, MD 21701				ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (Provide NAME if U.S. Academic Institution)		ASSOCIATE INVESTIGATORS			
NAME: Dettor, C.M., COL		NAME: Kardatzke, J.T.		NAME: Anderson, L.M.			
TELEPHONE: (301) 663-2434; AUTOVON 343-2434		TELEPHONE: (301) 663-7237; AUTOVON 343-7237		NAME: Nelson, J.H. POC:DA			
21. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER:					
Foreign Intelligence Not Applicable							
22. KEYWORD (Provide BACK with Security Classification Code) (U) Leco HD; (U) Micro Gen MS2-15; (U) Micro Gen LS2-15; (U) Micro Gen RSIW-5E; (U) Engineer Tests; (U) Ultra Low Volume (ULV)							
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Provide individual paragraphs identified by number. Provide back with Security Classification Code.)							
23. (U) To determine the durability of commercially available Ultra Low Volume (ULV) pesticide dispersal equipment by comparative type engineering tests. Units will be used by military medical and engineer personnel for controlling mosquito and other flying insects. Results will provide the user agencies with comparative durability data for purchase through military channels.							
24. (U) To determine the operational capabilities of skid mounted and special purpose ULV pesticide dispersal equipment by quantitative and qualitative methods. Measurable quantitative parameters include: particle size determination and maintenance of desired pressure and flow rate. General engineering design observations will include: corrosive effect of pesticide used during tests, verification of manufacturers' claim of performance specifications, general durability definitions as applied to mean time between breakdown, maintenance time, gas and oil consumption and definition of high mortality repair parts.							
25. (U) 7710 - 7809. Evaluations of the Leco HD, London Aire XW, Micro-Gen LS2-15, Micro-Gen MS2-15, Micro-Gen RE1-5, and Micro-Gen ED2-20 have been completed. Final reports are complete on all machines except the RE1-5 and ED2-20A (final reports are under preparation).							

TITLE: Evaluation of Skid Mounted and Special Purpose Ultra Low Volume (ULV) Pesticide Dispersal Equipment (Cont'd)

Recommend this work unit be continued in the 838 project area.

Recommend that all new incoming evaluation tasks of skid mounted and special purpose pesticide dispersal equipment be incorporated into this work unit.

REFERENCES

1. Letter, AFPCB to HQDA(SGRD-SDM), dated 9 June 1975, subject: Durability of Pesticide Dispersal Equipment.
2. Memorandum, HQDA(SGRD-SDM), dated 9 September 1975, subject: Responsibility for Research and Development of Pesticide Dispersal Equipment.
3. Letter, HQDA(SGRD-SDM) to USAMBRDL, dated 16 October 1975, subject: Engineering Design and Durability Testing.
4. Letter, AFPCB to HQDA(SGRD-SDM), dated 30 November 1976, with indorsement to USAMBRDL dated 6 January 1977, subject: Testing of Equipment for Standardization.
5. Letter, SGRD-UBH, to Micro-Gen Equipment Corporation, San Antonio, TX 78216, dated 4 April 1977, with indorsement back to USAMBRDL dated 13 April 1977, subject: Engineering Design and Durability Evaluation.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION [*]	2. DATE OF SUMMARY [*]	REPORT CONTROL SYMBOL	
				DA OA 6259	78 10 01	DD-DR&E(AR)636	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY [*]	6. WORK SECURITY [*]	7. REGRADING [*]	8. DISSEM INSTN'N	9. SPECIFIC DATA [*]	10. LEVEL OF SUM
78 05 01	H. TERMINATION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. / CODES [*]	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	62778A	3S162778A838		00	028 APC F725		
XXXXXX	62110A	3A162110A816		00	028		
XXXXXX	CARDS 114f						
11. TITLE (precede with Security Classification Code)* (U) Pulsed Water Pressure Device for Arm and Hand Washing							
12. SCIENTIFIC AND TECHNOLOGICAL AREA [*] 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD				
7012	7805	DA	C. In-House				
17. CONTRACT/GRANT							
A. DATES/EFFECTIVE:	EXPIRATION:	18. RESOURCES ESTIMATE					
B. NUMBER:		FISCAL	1980	A. PROFESSIONAL MAN YRS		B. FUNDS (In thousands)	
C. TYPE:	E. AMOUNT:	YEAR	78	0.1		01	
D. KIND OF AWARD:	F. CUM. AMT.:		79	0.0		00	
19. RESPONSIBLE DOD ORGANIZATION							
NAME* US Army Medical Bioengineering Research & Development Laboratory				NAME* US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS* Fort Detrick, Frederick, MD 21701				ADDRESS* Fort Detrick, Frederick, MD 21701			
20. RESPONSIBLE INDIVIDUAL							
NAME: Dettor, C.M., COL				NAME: Cranford, H.B.			
TELEPHONE: (301) 663-2434; AUTOVON 343-2434				TELEPHONE: (301) 663-7277; AUTOVON 343-7277			
21. GENERAL USE							
Foreign Intelligence Not Applicable				SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Prensky, W.C. NAME: POC:DA			
22. KEYWORDS (precede each with Security Classification Code) (U) Hand Washer; (U) Surgery; (U) Sterility; (U) Hand Scrubbing; (U) Pulsed Water							
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (number individual paragraphs identified by number. Precede text of each with Security Classification Code)							
23. (U) To fabricate a hand washer permitting surgical washing of hands in a shorter time than with conventional scrubbing techniques in field medical facilities.							
24. (U) Investigate various means of delivering pulsating water within a confined cylinder, fitted with leakproof collars into which hands can be inserted for washing. Coordination of effort to be made with USAIDR.							
25. (U) 7710 - 7804. Evaluation by USAIDR completed. Project terminated by Joint Working Group 22 March 1978.							

DETAIL SHEET

TITLE: Pulsed Water Pressure Device For Arm and Hand Washing

WORK UNIT NO: 028

AGENCY ACCESSION NO: DA OA 6259

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The objective of the task is to fabricate a hand washer permitting surgical washing of hands in a shorter time than with conventional scrubbing techniques in field medical facilities.

The task was established 7 December 1970 (reference 1) as Work Unit No. 816.14.028. On 27 May 1971 (reference 2) the technical characteristics of the unit were established in greater detail. The characteristics were based on the USAIDR's breadboard unit. A briefing was held on 18 October 1971 (reference 3) where the newly completed unit was demonstrated and changes recommended to improve versatility. The unit was shipped to USAIDR on 10 December 1971.

Colonel Cutright, et al, published a paper in February 1972 (reference 4) giving results of work with the USAIDR breadboard unit which was not fabricated by MERDL. USAIDR indicated on 2 August 1972 (reference 5) that the MERDL unit had been thoroughly tested and further testing for 15-18 months will be required to complete the proposed projects. The additional testing will evaluate different pressures, chemicals, hole size, etc.

On 25 July 1973, a meeting was held (reference 6) where USAIDR stated their requirements for a new breadboard model.

A meeting between USAMBRDL and USAIDR personnel was held 2 April 1974 (reference 7) in which the technical characteristics of the USAMBRDL Unit was presented to USAIDR. USAIDR suggested several changes to the unit. A demonstration of the unit's capabilities was given. It was agreed that USAMBRDL personnel would perform all changes and major maintenance while the unit is at USAIDR. Another meeting was held between USAIDR and USAMBRDL on 24 April 1974 (reference 8). The unit with changes was demonstrated. It was requested that minimum water level and maximum disinfectant concentrations be determined prior to delivery to USAIDR. The tests were performed and an operational manual prepared with delivery of the unit to USAIDR on 31 May 1974 (reference 9). The

unit (as delivered) has seven parameters that can be changed to optimize the function of the unit. Four of the parameters can be varied by USAIDR personnel.

Through the month of July 1974, USAMBRDL personnel trained USAIDR personnel and observed testing procedures. The unit was moved by USAIDR to the maternity ward at Walter Reed Hospital, 30 May 1975, for tests. Minor technical problems developed during the two years of operation, all of which were satisfactorily resolved. In January 1975 and September 26, 1975, articles appeared in Military Medicine (reference 10) and Stripe (reference 11) discussing the Arm and Hand Washers developed by USAIDR. The latter article was based on the USAMBRDL model. On 19 April 1976, the unit was returned to USAIDR.

A meeting was held between USAIDR, USAMRDC and USAMBRDL, 18 May 1976 (reference 12) in which USAIDR expressed the hope of preparing a report by Fall 1976. A report was prepared 6 August 1976, on the hospital testing by USAIDR (reference 13).

Literature searches have been performed in the areas of pulsating jet lavage. The only relevant paper found to date was published in February 1972 (reference 4).

Reference 14 requested the unit be returned to USAMBRDL since the report (reference 13) concludes that engineering modifications and maintenance are necessary prior to future clinical evaluation. References 15 and 16 state the unit will not be returned but a) two additional tests will be performed prior to release of the unit, and b) a list of desired modifications to the unit is to be compiled after the testing. At the request of SGRD-SDM, a literature search was conducted on the various types of hand cleaning antiseptic evaluation techniques. The data was used in the evaluation of reference 13. During the literature search, it was observed several types of antiseptic foams had been evaluated for rapid surgical scrubs (reference 17). A meeting was held with Dr. Phillips, USAMBRDL consultant, who reviewed reference 13 and the data from the literature searches. He felt a more effective evaluation would be a side by side comparison of the antiseptic foams and the Arm and Hand Washer. To date, both evaluations were by people and organizations with a vested interest in the product or equipment.

On 14 April 1977, the unit was examined at USAIDR and repaired on site as best as possible. The main problems were the pulsator would not run at the desired RPM and the tachometer was broken. Col Gross indicated he could complete the tests without the tachometer and with a slow pulsator (reference 18).

Col McLeod indicated that Delta Engineering and Sales, Inc., was interested in manufacturing the unit, but there might be some problem with patents. At her request, reference 19, the JAG indicated there would be no problem, since the patent was owned by the United States Government (reference 20). USAIDR had patented an earlier version of the Arm and Hand Washer in 1973 (reference 21).

PROGRESS

The unit was returned to USAMBRDL on 12 Mar 78. At a Joint Working Group Meeting held on 22 Mar 78 a decision was reached to terminate the work unit (reference 22).

REFERENCES

1. Letter, USAMRDC, MEDDH-MM, 7 Dec 1970, subject: New Work Units under Task No. 3A062110A816.14.
2. Rumore, T. T. and Chasin, J., Memorandum for the Record - Trip Report, Re: Subtask 816.14.027 - Water Pressure Device for Cleaning Anesthesia Equipment; and Subtask 816.14.028, Water Pressure Device for Arm and Hand Washing, 27 May 1971, MERDL.
3. Trip Report, USAMRDC, SGRD-SDM, 18 Oct 1970, Inspection of Breadboard Model of Pulsed Surgical Hand Scrubber and Conference Regarding Future Direction of Development, Major M. M. Belenry.
4. Cutright, D.; Bhaskar, S.; Gross, A.: et al., A new Method of Presurgical Hand Cleaning, Oral Surgery, Oral Medicine and Pathology, Vol. 33, No. 2, pp 127-162, Feb 1972.
5. Letter, U.S. Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, D.C., SGRD-UDP, 4 Aug 1972, subject: None.
6. Memorandum for Record, USAMBRDL, 1 Aug 1973, subject: Arm and Hand Washer, USAMBRDL, Task 816.14.028.
7. Memorandum for Record, USAMBRDL, 2 April 1974, subject: Pulsed Water Pressure Device for Arm and Hand Washing, Task No. 816.14.028.
8. Memorandum for Record, USAMBRDL, SGRD-UBX, 24 April 1974, subject: Pulsed Water Pressure Device for Arm and Hand Washer, Task No. 816.14.028.
9. Memorandum for Record, USAMBRDL, SGRD-UBE-G, 3 June 1974, subject: Arm and Hand Washer, USAMBRDL Task 816.14.028.
10. Military Medicine, AMSUS News Letter, Jan 1975, Vol. 140, No. 1.
11. Chidel, Beverly, "Scrubbing In: USAIDR Has Made the Process Faster and More Effective", "The Stripe", Vol. XXXI, No. 37, September 26, 1975, Markap Publishing Company.
12. Memorandum for Record, USAMBRDL, H. Bruce Cranford, Jr., 18 May 1976.
13. Letter, U.S. Army Institute of Dental Research, Walter Reed Army Medical Center, Washington, D.C., SGRD-UDZ, 6 Aug 1976, subject: None.

14. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 10 Sep 1976, subject: Pulsed Water Pressure Device for Arm and Hand Scrubbing.
15. Memorandum for Record, USAIDR, SGRD-UDZ, subject: Meeting Concerning the Future of Hand Scrubber, dated 13 December 1976.
16. Trip Report, subject: To Discuss Changes to the Arm and Hand Washer, 16 Dec 1976, USAMBRDL, dated 27 Dec 1976.
17. Dewar, N., Gravens, D., "Effectiveness of Septisol Antiseptic Foam as a Surgical Scrub Agent", Applied Microbiology, Oct 1973, pgs 544-549, Vol. 26, No. 4.
18. Trip Report, subject: To Examine and Repair Arm and Hand Washer, 14 Apr 1977, USAMBRDL, dated 21 April 1977.
19. D/F, subject: "Pulsed Water Device for Hand and Arm Scrubbing", USAMRDC, SGRD-RO, 8 May 1977.
20. Letter, DAJA-PA, 8 July 1977, subject: none., to Mr. James Kellum, President, Delta Engineering and Sales, Inc., Arlington, Texas.
21. Patent, U.S. #3,757,806, September 11, 1973, Pulsating Hydrojet Lavage Device, Bhaskar, et al.
22. Letter, SGRD-OP, 20 Apr 78, subject: Recommendations/Decisions of Joint Working Group, 22 March 78.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL		
3. DATE PREV SUMMARY 78 05 01	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY SECY ^c U	6. WORK SECURITY ^d U	7. REGRADING ^e NA	8. DA DISBN INSTN'N NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM- A. WORK UNIT	
10. NO./CODES ^f				PROGRAM ELEMENT	PROJECT NUMBER	TASK AREA NUMBER		WORK UNIT NUMBER
A. PRIMARY XXXXXX	62778A	3S162778A838		00	029 APC F726			
B. CONTRACTUAL XXXXXX	62110A	3A162110A816		00	029			
C. CARDS	114f							
11. TITLE (Provide with Security Classification Code) (U) Universal Ventilator								
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering								
13. START DATE 7012	14. ESTIMATED COMPLETION DATE 7806			15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE				
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:				EXPIRATION:	FISCAL YEAR	PREVIOUS	A. PROFESSIONAL MAN YRS 0.0	
					78		00	
					79		00	
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (PURCHASE MAN IF U.S. Academic Institution)				
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				NAME: Ismach, A. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:				
21. GENERAL USE Foreign Intelligence Considered				ASSOCIATE INVESTIGATORS				
				NAME: Malek, J.W.				
22. KEYWORD (Provide each with Security Classification Code) (U) Ventilator; (U) Respirator; (U) Controlled Assister; (U) Breather; (U) Intermittent Positive Ventilator; (U) Resuscitator; (U) Anes Ventilator; (U) Mechanical Ventilator								
23. (U) To develop a safe, effective, mechanical ventilator suitable for use on all age groups, as a surgical ventilator in the operating room and as a ventilator/resuscitator in the recovery room.								
24. (U) To refine existing circuitry to obtain greater dependability, ruggedness and increased sensitivity in the assister mode of operation. Evaluation will be made on laboratory analogs prior to experimental use on animals and clinical evaluation on humans.								
25. (U) 7710 - 7804. No progress. Task terminated at Joint Working Group meeting held on 22 March 1978. Final resolution of a ventilator development will depend on findings of US Navy Respirator Development Program (Contract N61339-7J-C-0013 awarded to General Electric Company).								
POC:DA								
145								
1978								
*Available to contractors upon contractee's approval.								
DD FORM 1 MAR 88 1498		PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 88 AND 1498-1, 1 MAR 88 (FOR ARMY USE) ARE OBSOLETE.						
* U.S. GPO: 1974-540-843/8691								

DETAIL SHEET

TITLE: Universal Ventilator

WORK UNIT NO: 029

AGENCY ACCESSION NO: DA OA 6260

PRINCIPAL INVESTIGATOR: Ismach, A.

BACKGROUND

The task was established to develop a Universal Multi-purpose Ventilator that could be used throughout the hospital, on all age groups. This unit was intended to replace specialty ventilators, thereby reducing types of ventilators required in a field hospital, reducing numbers and types of units required, thereby reducing logistic requirements and simplifying maintenance and training.

The task was originally established as an ILIR program (91C and 91B) employing Dr. Robert Hustead, M.D. as a consultant. In a meeting held at Fort Totten on 22 June 1966 with Dr. Hustead, it was decided to design and fabricate a universal cycling unit which could be employed to ventilate the range of individual from new born to mature adult. During 3rd Qtr FY 67, a prototype was fabricated to meet new design requirements. In April 1967, the prototype was tested at Mercy Hospital, Kansas City, Missouri, by Dr. Hustead. The unit operated satisfactorily as an open circuit ventilator, but lacked sufficient spill capacity during use in a close circuit anesthesia loop. A new spill valve was designed and a new prototype fabricated. This unit was clinically evaluated by Dr. Lord at the Albert Einstein Medical Center. He requested the addition of an "assist" feature. The Unit was redesigned to include this feature, and the modified unit was laboratory tested at the University of Kansas Medical Center by Dr. Hustead during June 1968. Increased sensitivity was desired and the unit was again redesigned.

The unit was submitted to Dr. Edgar Yhap, Chief of Anesthesia and Resuscitation, WRAIR. Basic data on the capability of the unit was obtained. It was decided to terminate the ILIR task and complete the development under an officially funded work unit, which was established during December 1970.

Based on previous experience, new novel circuit configurations were developed. To obtain increased sensitivity in the assistor circuit, fluid amplification was inserted between the sensor and the triggering bleeder valve. A new prototype was assembled and subjected to engineering design testing to optimize circuit configurations. A patent (U.S. Pat. 3,556,095) dated

19 January 1971 was granted on the device. In September 1971, at the request of Dr. Hustead, a Positive End Expiratory Pressure Valve was designed and incorporated into the unit.

On 9 October 1971, the Project Engineer visited Dr. Hustead of the University of Kansas Medical Center where a thorough laboratory evaluation of the unit employing simulated loads and recording flow pressure traces was accomplished. During testing, local modifications to the breathing circuit were made to improve performance. On 21 October 1971, the ventilator was brought into surgery and used successfully on a patient as an anesthesia ventilator.

On 14 October 1971, the unit was demonstrated to Dr. Mendenhall, Brooke Army Hospital, Department of Anesthesiology, Fort Sam Houston, Texas. Dr. Mendenhall served as a consultant to the Army Surgeon General. Dr. Mendenhall approved basic concept, but requested addition of three features: (1) alarm circuit for accidental patient disconnect; (2) heated humidifier for long time open circuit ventilation; and (3) a means for providing varying air-oxygen mixtures.

During October 1971 an alarm circuit was designed at USAMERDL and incorporated on the prototype. In May 1972 the Project Engineer visited the Medical Research Lab, Edgewood, Maryland, and examined the humidifier (employing copper ribbon in a reflux column arrangement), heated by a 25-50 watt electrical heater, developed previously by Ken Wilson and which could be easily incorporated into the breathing circuit. On 1 June 1972 arrangements were made by Dr. Van Sim and Ken Wilson to have the unit delivered to Dr. Donald Benson, Chief of Anesthesiology at Johns Hopkins Medical School for his evaluation. In December 1972, Dr. Benson summarized his findings in a letter report, indicating that "it works very well in anesthesia, does exactly what is asked of it in spite of changes in compliance and patients. It has been very reliable and all in all we have found it an excellent adjunct for our anesthesia care." No evaluation had been made in the area of intensive care for use on protracted respiration.

In June 1973 a draft proposed ROC was written at USAMBRDL and hand carried to the Academy of Health Sciences, Fort Sam Houston, Texas. On 26 October 1974, the unit was picked up from Dr. Benson, Johns Hopkins, due to his taking a new position at the University of Chicago Medical Center. He confirmed that he found the unit to be a fine anesthesia ventilator, but believed that the controls would be too complex for use by the average technician in recovery rooms. Re-evaluation of the controls is indicated. Dr. Hustead shares Dr. Benson's opinion on controls. It was concluded that a multi-purpose ventilator suitable for field military use is feasible. The ground work for such a unit has been laid, however, redesign will be necessary to obtain simplified controls.

Release of LR has been held in abeyance pending evaluation of a portable volume controlled respirator developed for the U.S. Navy (Contract N61339-

75-C-0013 to General Electric Company). USAMBRDL commented on 22 July 1977, on the ability of latter unit to meet the draft LR requirements. Prototypes of the Navy unit are being evaluated at WRAIR and at LAIR.

PROGRESS

Task remained in an inactive status pending preparation of a requirements document and results of the U.S. Navy contract with General Electric Co. At a Joint Working Group held on 22 March 78 it was decided to terminate present work unit. When, and if, a requirements document is generated a new development task would be established.

REFERENCES

1. Proposed In-House R&D Project, MERDL, Title: Field Infant Ventilator.
2. Status Report, letter from Dr. Hustead, dated June 1964.
3. Letter, MERDL, dated 23 December 1968, subject: "Evaluation of Ventilator".
4. Letter, WRAIR, dated 26 November 1969, MEDEC-ZLA, subject: Comparative Evaluation of Resuscitation.
5. Letter, USAMRDC, dated 7 December 1970, MEDDH-MM, subject: "New Work Units under Task No. 3A062110A816.14".
6. Trip Report, USAMERDL, dated 27 October 1971, "Universal Ventilator" visit to University of Kansas and Brooke Army Hospitals.
7. Letter, The Johns Hopkins University, School of Medicine, Division of Anesthesiology, dated December 20, 1972.
8. Letter, USAMBRDL, dated 19 January 1973, SGRD-UBE, subject: "Task No. 816.14.029, Universal Ventilator".
9. 2nd Ind, USAMBRDL, dated 22 July 1977, SGRD-UBE, to letter, HSA-CDM, dated 16 May 1977, subject: "Multipurpose Ventilator, ACN 23342".
10. Letter, SGRD-OP, 20 April 1978, "Recommendations/Decisions of Joint Working Group, 22 March 1978."

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
3. DATE PREV SURVEY	4. KIND OF SUMMARY	5. SUMMARY ACTY ⁴	6. WORK SECURITY ⁵	DA 0B 6231	78 10 01	DD-DR&E(AR)636
78 05 30	D. CHANGE	U	U	NA	NL	7. REGRADING ⁶ 8. DISEN INSTRN 9. SPECIFIC DATA CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ⁷	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		11. LEVEL OF SUM A. WORK UNIT
A. PRIMARY	62778A	3S162778A838		00		030 APC F795
B. CONTRIBUTING						
C. XXXXXXXX	CARDS 114f					
12. TITLE (Pecede with Security Classification Code) (U) Power Supply, Surgical Light, Engineering Evaluation of						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment						
14. START DATE	15. ESTIMATED COMPLETION DATE	16. FUNDING AGENCY		17. PERFORMANCE METHOD		
7806	7905	DA		C. In-House		
18. CONTRACT/GRANT				19. RESOURCES ESTIMATE	20. PROFESSIONAL MAN YRS	21. FUNDS (in thousands)
22. DATES/EFFECTIVE:				PREVIOUS		
23. NUMBER ⁸				FISCAL YEAR	0.1	02
24. TYPE:				CURRENT		
25. AMOUNT:				79	0.6	30
26. KIND OF AWARD:				27. CUM. AMT.		
28. RESPONSIBLE DOD ORGANIZATION				29. PERFORMING ORGANIZATION		
NAME: US Army Medical Bioengineering Research & Development Laboratory				NAME: US Army Medical Bioengineering Research & Development Laboratory		
ADDRESS: Fort Detrick, Frederick, MD 21701				ADDRESS: Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (PUNISH SSAN IF U.S. Academic Institution)		
NAME: Dettor, C.M., COL				NAME: Salisbury, L.L.		
TELEPHONE: (301) 663-2434; AUTOVON 343-2434				TELEPHONE: (301) 663-7277; AUTOVON 343-7277		
30. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER		
Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS		
				NAME: Stup, J.		
				NAME: POC: DA		
32. KEYWORD (Pecede each with Security Classification Code) (U) Field Light; (U) Surgical Light; (U) Power Supply; (U) Field Surgery; (U) Field Medical Equipment						
33. TECHNICAL OBJECTIVE, ⁹ 24. APPROACH, 25. PROGRESS (Pecede individual paragraphs identified by number. Pecede text of each with Security Classification Code.)						
23. (U) To conduct an engineering evaluation of the current standard power supply unit (NSN 6530-00-131-6974) to determine feasibility of modifying the item or need for a new product design to eliminate field complaints.						
24. (U) Conduct a survey of field complaints, prepare a test protocol to verify complaints, conduct in-house evaluation and prepare a final engineering evaluation report so that a decision as to whether a requirements document or a product improvement document would be in order.						
25. (U) 7805 - 7810. The major complaint with the unit is the loss of electrolyte during operation. The cause of this has been identified as a lack of voltage regulation in the system. A report identifying the problem along with two possible solutions is being prepared.						

DETAIL SHEET

TITLE: Power Supply, Surgical Light, Engineering Evaluation of

WORK UNIT NO: 030

AGENCY ACCESSION NO: DA OB 6231

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

A number of complaints have been received from the field concerning the power supply for the MUST surgical light. This was referred to USAMBRDL for evaluation and identification of the problems. If problems were identified which were of an engineering nature, solutions were to be recommended. This would be input into the decision making process for determination of the most cost effective course of action.

PROGRESS

The problem has been identified as a lack of regulation in the charging circuit resulting in a continuous overcharging of the batteries. Two solutions are proposed, a) a retrofitting of a regulator to existing stock or b) a redesign using new switching power supply technology.

REFERENCES

1. Letter, SGRD-OP, dated 1 May 78, subject: Establishment of Work Units.
2. Letter, SGRD-UBE-G, dated 5 June 78, subject: Power Supply, Surgical Light, Engineering Evaluation of.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁶	2. DATE OF SUMMARY ⁷	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRT ⁸	6. WORK SECURITY ⁹	DA OB 6232	78 10 01	DD-DR&S(AR)636
78 05 15	D. CHANGE	U	U	NA	NL	7. REBRADING ¹⁰ <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ¹¹	PROGRAM ELEMENT	PROJECT NUMBER		8. TASK AREA NUMBER	9. SPECIFIC DATA ¹² CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
A. PRIMARY	62778A	35162778A838		00	10. WORK UNIT NUMBER 031 APC 794	
B. CONTRIBUTING						
C. CONTRIBUTING						
11. TITLE (Provide with Security Classification Code) (U) Splint, Pneumatic, Engineering Evaluation of						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ¹³ 002400 Bioengineering; 009800 Medical and Hospital Equipment						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7805	7901	DA		C. In-House		
17. CONTRACT/GRAANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PREVIOUS	CURRENT	0.1	01
B. NUMBER ¹⁴ :			78			
C. TYPE:	6. AMOUNT:		79		0.2	10
D. KIND OF AWARD:	E. CUM. AMT.					
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME ¹⁵ :	US Army Medical Bioengineering Research & Development Laboratory	NAME ¹⁶ :	US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS ¹⁵ :	Fort Detrick, Frederick, MD 21701	ADDRESS ¹⁶ :	Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (Provide name if U.S. Academic Institution)				
NAME:	Dettor, C.M., COL	NAME:	O'Connor, R.J.			
TELEPHONE:	(301) 663-2434; AUTOVON 343-2434	TELEPHONE:	(301) 663-7277; AUTOVON 343-7277			
23. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER:				
Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS				
		NAME:	NAME:			
		NAME:	NAME:			
24. KEYWORDS (Provide each with Security Classification Code) (U) Field; (U) Pneumatic Splint; (U) Inflatable Splint; (U) Limb Immobilization; (U) Medical Equipment						
25. TECHNICAL OBJECTIVE, ¹⁶ 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Provide rest of each with Security Classification Code.)						
23. (U) To evaluate field complaints concerning pneumatic splints to determine future course of action.						
24. (U) Splints will be obtained and subjected to engineering tests to determine operational deficiencies or component failures.						
25. (U) 7805 - 7809. Information has been gathered on the procurement history of pneumatic splints. The nature of the complaints from the field has been determined. Samples of units which have failed in use have been requested.						
*Available to contractors upon contractor's approval						

DD FORM 1498
1 MAR 68

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 68
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

DETAIL SHEET

TITLE: Splint, Pneumatic, Engineering Evaluation of

WORK UNIT NO: 031

AGENCY ACCESSION NO: DA OB 6232

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

On a field visit by a U.S. Army Materiel Systems Analysis Activity (AMSAA) team to Fort Bragg, North Carolina, a complaint was received regarding the failure of the slide fasteners (zippers) on the pneumatic arm and leg splints (NSN6515-00-935-6592 and NSN 6515-00-935-6593). The failure of the zipper was caused by the actual coming apart of the chain.

The nature of the complaint indicates that the pneumatic splint may be a candidate for product improvement.

PROGRESS

Information on the procurement history of both the pneumatic arm and leg splints was obtained from the Defense Personnel Support Center (DPSC). Contact with the original source of the complaint at Fort Bragg was established. Samples of splints which have failed in use have been requested.

REFERENCES

1. Report of Field Visit, USAMSA, Aberdeen Proving Ground, MD., Trip No: 78L01, 5-18 Feb 1978, page 4-9.
2. Letter, SGRD-OP, dated 9 May 1978, subject: Pneumatic Splints.
3. Letter, SGRD-UBE-G, dated 17 May 1978, subject: Pneumatic Splints.
4. Letter, SGRD-UBE-G, dated 12 Sept 1978, subject: Pneumatic Splints. (NSN 6515-00-935-6592 and 6515-00-935-6593).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b DA OB 6233	2. DATE OF SUMMARY ^b 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 78 06 15	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SECY ^b U	6. WORK SECURITY ^b U	7. REGRADING ^b NA	8. DISSEM INSTN ^b NL	9. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ^a PROGRAM ELEMENT		PROJECT NUMBER 62778A		TASK AREA NUMBER 00	11. WORK UNIT NUMBER 033 APC F796	
12. CONTRIBUTING XXXXXXXXXX		CARDS 114f				
13. TITLE (Provide each with Security Classification Code) (U) Light, Surgical, Battalion Aid Station; Engineering Evaluation of						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment						
15. START DATE 7806		16. ESTIMATED COMPLETION DATE 7902		17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House	
19. CONTRACT/GRANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN YRS		22. FUNDS (In thousands)
23. DATES/EFFECTIVE: EXPIRATION:		FISCAL YEAR PRECEDING 78		0.0		00
24. NUMBER: 25. TYPE: 26. KIND OF AWARD:		CURRENT 79		0.2		10
27. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		28. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
29. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		30. PRINCIPAL INVESTIGATOR (Provide name if U.S. Academic Institution) NAME: Prensky, W.C. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:				
31. GENERAL USE Foreign Intelligence Not Applicable		32. ASSOCIATE INVESTIGATORS NAME: Crampton, K.				
33. KEYWORD (Provide each with Security Classification Code) (U) Field Equipment; (U) Lighting; (U) Surgical Light; (U) Field Light						
34. TECHNICAL OBJECTIVE, 35. APPROACH, 36. PROGRESS (Provide individual paragraphs identified by number. Provide each with Security Classification Code)						
23. (U) To conduct an engineering evaluation of the surgical light to determine feasibility of modifying the item or need for a new product design to eliminate complaints.						
24. (U) Conduct tests and evaluations to assess improvements to the surgical light to enhance its effective lighting of work area, to provide an extension cable, to modify the clamp to attach to a greater variety of supports, to develop a transport case and to add a converter to allow operation from 110V AC sources.						
25. (U) Earlier project files have been acquired and research into the history of this device has commenced.						

DETAIL SHEET

TITLE: Light, Surgical, Battalion Aid Station; Engineering Evaluation of

WORK UNIT NO: 033

AGENCY ACCESSION NO: DA OB 6233

PRINCIPAL INVESTIGATOR: Prensky, W. C.

BACKGROUND

This task was established in June, 1978 in response to a request from SGRD-OP to conduct Technical Feasibility Testing of the Surgical Light to support initiation of a Product Improvement Program. Desired improvements include enhancing the effective lighting of the work area, providing an extension power cable, changing the clamp to allow attachment to a greater variety of supports, developing a transport case and adding a power converter to permit operation from 110 VAC sources.

PROGRESS

Earlier project files have been acquired. A complete study covering the history of the device has been initiated.

REFERENCES

1. Letter, SGRD-OP, undated, "Light, Surigcal, Battalion Aid Station".
2. Letter, SGRD-UBE-G, dated 27 June 1978, "Light, Surgical, Battalion Aid Station, Engineering Evaluation of, Task No. A838.00.033".

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ^b	6. WORK SECURITY ^b	7. REGRADING ^b	8a. DISC'DN INSTR'N	8b. SPECIFIC DATA-CONTRACTOR ACCESS
77 10 01	K. COMPLETION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES ^b	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
a. PRIMARY	62778A	35691000A838		00	035 APC F838	
b. CONTRIBUTING	XXXXXX	CARDS 114f				
11. TITLE (Provide with Security Classification Code) (U) Applied Research Effort for Mosquito Control in Dredge Disposal Areas						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 005900 Environmental Biology; 002600 Biology; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7703	7712	DA	C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (In thousands)
a. DATES/EFFECTIVE:		b. EXPIRATION:		c. PRECEDING		
d. NUMBER:		e. FISCAL YEAR		f. CURRENT		g. 05
g. TYPE:		h. AMOUNT:		i. 79		j. 0.0
k. KIND OF AWARD:		l. CUM. AMT.:		m. 0.0		n. 00
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR /Funder DEAN // U.S. Academic Institution NAME: Nelson, J.H. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Driggers, D.P. NAME: Desrosiers, R.E.		POC:DA		
22. KEYWORD (Provide each with Security Classification Code) (U) Dredge Disposal Areas; (U) Pest Management; (U) Mosquito Control; (U) Pesticide; (U) Controlled-Release Larvicide						
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Provide individual paragraphs identified by number. Provide last of four DOD Security Classification Code.)						
23. (U) To conduct applied research essential to determine the feasibility of long-range mosquito control within selected diked disposal areas adjacent to the Atlantic Intracoastal Waterway, through the use of a controlled-release formulation of chlorpyrifos (i.e., Dursban 10 CR).						
24. (U) Pre-treatment surveys will be made of four dredged material areas (out of a total of 50) to determine larval mosquito species diversity and population densities. Application of Dursban 10 CR would then be made with an appropriate backpack unit, in accordance with label instructions with strict attention given to human and environmental safety. Post-treatment natural larval mosquito population densities will be checked weekly for the first 4 weeks, then monthly during the mosquito breeding season for a period of 1 year, and thereafter on a quarterly basis until the area is refilled. Water samples for selected sites around the outside perimeter of each dredged material area will be collected and analyzed for pesticide residues using GLC methods.						
25. (U) 7710 - 7809. Selected mosquito breeding sites were monitored during the year. Application of Dursban 10 CR was completely effective in reducing mosquito populations and in totally eliminating them from some disposal areas. Advice was given to continue with surveillance of dredge disposal areas and to treat those areas only after mosquito larva were detected.						

DETAIL SHEET

TITLE: Applied Research Effort for Mosquito Control in Dredge Disposal Areas

WORK UNIT NO: 035

AGENCY ACCESSION NO: DA 08 6154

PRINCIPAL INVESTIGATOR: Nelson, J.H.

BACKGROUND

Historically, the Corps of Engineers has disposed of dredged materials by discharge directly onto the banks within the intercoastal waterways system. Severe criticisms voiced by various environmental groups concerning this practice have resulted in the construction of confined disposal areas throughout the intercoastal waterway system in order to contain dredged materials.

When dredged material is pumped into the disposal areas, (usually on a 18-24 mo. cycle) the suspended material is allowed to settle out and the overlying water is drained off. The disposal areas then become entirely contained subject only to occasional incomplete inundation by rainfall. These rainfall and drying cycles throughout the year cause large, deep cracks to form within the dredged material which become exceptionally productive breeding areas for mosquitoes.

Previous mosquito control within the dredged materials areas in North Carolina has been restricted to the use of Flit MLO as a larvicide. Due to the limited duration of effective of this compound, frequent reapplications throughout each year's breeding season make this method of control quite expensive. A commitment of funds by the Wilmington, NC District Corps of Engineers is made each year directly to the affected County Mosquito Control Agencies.

The District Corps of Engineers at Wilmington, NC has requested that the US Army Medical Bioengineering Research and Development Laboratory (USAMBRDL), Fort Detrick, MD, consider undertaking a research project to determine the feasibility of long-range mosquito control within the confined dredged materials areas, through use of a controlled-release formulation of chlorpyrifos (i.e. Dursban 10CR).

TITLE: Applied Research Effort for Mosquito Control in Dredge Disposal Areas (Cont'd)

Besides the obvious results to be obtained, such a research endeavor would also enable USAMBRDL to fulfill obligations for evaluation of a solid pesticide backpack for use by TOE units in accordance with the request from CDR, Medical R&D Command, dated 21 June 1976.

PROGRESS

Applications of Dursban 10 CR were made on selected mosquito breeding sites utilizing two backpack dispersal units. Results of these tests as determined by programmed monitoring visits indicate that Dursban 10 CR applications are completely effective in reducing and/or totally eliminating mosquitoes from the disposal areas. Advice was given to continue with surveillance of dredge disposal areas and to treat those areas only after mosquito larva were detected.

REFERENCES

1. Letter, SAWCO-NI to SGRD-SDM, dated 22 Nov 76, subject: Request for Applied Research Effort by US Army Medical Bioengineering R&D Laboratory (USAMBRDL) to Determine Feasibility of Long-Range Mosquito Control in Diked Disposal Areas.
2. Letter (1st Ind), DA-USAMRDC to USAMBRDL, dated 4 Dec 76, subject as above.
3. Letter, USAMBRDL to HQDA(SGRD-SDM), dated 10 Dec 76, subject as above.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6156	2. DATE OF SUMMARY# 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636	
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY# U	6. WORK SECURITY# U	7. REGARDING# NA	8. DISSEM INSTRN# NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
10. NO./CODES# A. PRIMARY 62778A XXXXXX XXXXXX XXXXXX XXXXXX CARDS 114f				PROJECT NUMBER 35162778A838 3A162110A816		TASK AREA NUMBER 00 00	
11. TITLE (Provide with Security Classification Code) (U) Utility Unit, Dental Operating, Field							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE 7507		14. ESTIMATED COMPLETION DATE 7909		15. FUNDING AGENCY DA		16. PERFORMANCE METHOD C. In-House	
17. CONTRACT/GRANT A. DATE/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:				18. RESOURCES ESTIMATE FISCAL YEAR		19. PROFESSIONAL MAN YRS 0.3 17	
				EXPIRATION: CURRENT		20. FUND\$ (in thousands) 79 0.0 00	
21. RESPONSIBLE DOD ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				22. PERFORMING ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNISHABLE IF U.S. GOVERNMENT CONTRIBUTING) NAME: Malek, J.W. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:			
23. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
24. KEYWORD (Provide each with Security Classification Code) (U) Dental Portable Equipment; (U) Dental Field Equipment; (U) Dental Field Systems; (U) Dental Operating Unit							
25. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (PUNISHABLE IF PERTINENT PARAGRAPHS IDENTIFIED BY NUMBER PROVIDED ON THE REVERSE SIDE OF EACH WITH SECURITY CLASSIFICATION CODE)							
23. (U) To develop a dental utility unit which will provide field dental personnel with a self-contained, pressurized water supply and evacuation system for use in support of air driven dental operating and prophylaxis handpiece systems.							
24. (U) Design and fabricate a utility unit and clinically evaluate it in conjunction with the air driven handpiece systems.							
25. (U) 7710 - 7809. A single diaphragm pump was investigated to reduce weight and cube. Evaluation indicated that the turbine was insufficient to accomplish the requirement and redesign using a double-end pump has been initiated.							

DETAIL SHEET

TITLE: Utility Unit, Dental Operating, Field

WORK UNIT NO: 039

AGENCY ACCESSION NO: DA OB 6156

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

A need exists to develop a lightweight self-contained source of pressure and vacuum to provide a pressurized water and air supply and a saliva ejector for use by dental personnel in the field.

An initial design was investigated using a double end pump for the air and water supplies. However, at that time, an electric hand piece was considered to be an essential part of this design.

PROGRESS

A single commercial unit (Century 21) was evaluated this past year. Results were not satisfactory, especially the possibility of cross-contamination from the saliva ejector to the Tri-Flo syringe. It has been decided to return to the double-ended pump, but with an air-driven hand piece. Work unit will be held in abeyance pending receipt of a requirements document and adequate funding.

REFERENCES

1. Letter, SGRD-SDD, dated 3 July 1975.
2. Letter, SGRD-UBE-G, dated 17 July 1975.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
1. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCITY U	6. WORK SECURITY ⁴ U	7. REGRADING ⁵ NA	8. DODW INSTN ⁶ NL	9. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES ⁷ PROGRAM ELEMENT A. PRIMARY 62778A B. CONTRIBUTING XXXXXX XXXX CARD 114f				PROJECT NUMBER 3S162778A838	TASK AREA NUMBER 00	11. LEVEL OF SUM A. WORK UNIT 040 APC F771
12. TITLE (Printed with Security Classification Code) (U) Field Medical Devices and Laboratory Equipment						
13. SCIENTIFIC AND TECHNOLOGICAL AREA ⁸ 009800 Medical and Hospital Equipment; 010100 Microbiology						
14. START DATE 7610	14. ESTIMATED COMPLETION DATE 8010	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:		EXPIRATION:	18. RESOURCES ESTIMATE FISCAL YEAR 78 79	19. PROFESSIONAL MAN YRS CURRENT 0.2 2.4	20. FUNDS (in thousands) 08 120	
21. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		22. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR/PRINCIPAL SCIENTIST U.S. ARMY MEDICAL BIOENGINEERING NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Pace, R.R. NAME:				
23. GENERAL USE Foreign Intelligence Not Applicable		POC: DA				
24. KEYWORDS (Printed with Security Classification Code) (U) Laboratory Equipment; (U) Medical Field Devices; (U) Test Kits						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Printed in other paragraphs identified by number. Proceed text of area with security classification code.) 23. (U) To develop through exploratory studies field medical devices and laboratory equipment to be available to Army field medical units. 24. (U) Exploratory development studies to determine required lightweight self-contained modular equipment elements needed to measure homeostatic variables in forward areas. Equipment is designed to be self-contained, field maintainable and capable of operating in all environments. Initial efforts will be oriented toward blood chemistry. 25. (U) 7710 - 7809. A self-calibrating, microprocessor controlled device capable of measuring glucose, direct and total bilirubin, creatine, and BUN has been constructed. Programming of microprocessor is completed. An approved LOA has been received. Efforts are being directed to identifying essential field clinical test requirements and where in the health care chain they are first performed. This information is essential for the design of an integrated, modular field clinical analysis system.						

* Available to contractors upon originator's approval

DD FORM 1498
MAR 68

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

* U.S. GPO: 1974-540-843/8691

DETAIL SHEET

TITLE: Field Medical Devices and Laboratory Equipment

WORK UNIT NO: 040

AGENCY ACCESSION NO: DA OB 6185

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

The purpose of this task is to develop a reliable, lightweight, modular clinical laboratory system for use in field medical units. An initial effort toward developing a micro-processor controlled device for measuring blood chemistry has proven the feasibility of the approach.

PROGRESS

Efforts are under way to determine the minimum number of clinical tests required in the field and where in the health care chain these tests are first encountered. A modular approach is being considered where the increased sophistication required at each succeeding level of care is accomplished by the addition of more modules.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SECY U	6. WORK SECURITY U	7. REGRADING NA	8. DA DISSEM INSTN NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES: A. PRIMARY 62778A	PROGRAM ELEMENT PROJECT NUMBER 3S162778A838			TASK AREA NUMBER 00	11. LEVEL OF SUM A. WORK UNIT 044 APC F776	
B. CONTRIBUTING XXXXXX CARD 1404A						
12. TITLE (Provide with security classification code) (U) Portable Pesticide Dispersal Equipment (Backpack)						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering						
14. START DATE 7610	15. ESTIMATED COMPLETION DATE 8010	16. FUNDING AGENCY DA		17. PERFORMANCE METHOD C. In-House		
18. CONTRACT/GRANT		19. RESOURCES ESTIMATE EXCEEDING		20. PROFESSIONAL MAN-YRS 0.6		21. FUNDS (In thousands) 50
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:		FISCAL YEAR	CURRENT	79	1.3	42
22. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		23. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		24. PRINCIPAL INVESTIGATOR (Provide name if U.S. Government institution) NAME: Kardatzke, J.T. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER:		
25. GENERAL USE Foreign Intelligence Not Applicable		26. ASSOCIATE INVESTIGATORS NAME: Anderson, L.M. NAME: Nelson, J.H.		POC:DA		
27. KEYWORD (Provide each with security classification code) (U) Backpack; (U) Solid/Liquid Dispersal; (U) Arthropod Control; (U) Lightweight; (U) Durable; (U) Disease Vectors; (U) Portable						
28. TECHNICAL OBJECTIVE: 29. APPROACH: 30. PROGRESS (Provide one-line paragraphs identified by number. Provide last of work with security classification code.)						
23. (U) To identify a commercially available, lightweight, durable, backpack unit capable of dispersing solid or liquid pesticide formulations. This unit would be used by preventive medicine personnel in combat zones and CONUS for controlling disease vectors and pest arthropods.						
24. (U) A review of commercially available backpack units will be made. Suitable units will be field evaluated. After entomological feasibility has been established, modifications, if necessary, will be made and formal testing coordinated with responsible agencies.						
25. (U) 7710 - 7809. Thirteen commercially available portable backpack pesticide dispersal units have been identified, procured and are being evaluated for military applicability.						

DETAIL SHEET

TITLE: Portable Pesticide Dispersal Equipment (Backpack)

WORK UNIT NO: 044

AGENCY ACCESSION NO: DA OB 6193

PRINCIPAL INVESTIGATOR: Kardatzke, J.T.

BACKGROUND

A review by the SGO, of the available pesticide dispersal units, ground and air, has revealed that the mission of the Preventive Medicine Team LA, Entomology Service (TOE 8-620H) may be severely impaired by the lack of this dispersal equipment. A requirement, initiated by the SGO, was sent to USAMRDC and ultimately to USAMBRDL for action to initiate a series of tasks on a priority basis to correct these deficiencies. The pesticide dispersal unit, solid/liquid backpack is one of these tasks.

The requirements and resources for two other work units generated in conjunction with this work unit have been integrated into this work unit. This work unit has subsequently been redesignated Portable Pesticide Dispersal Equipment.

The three work units which have been integrated into this task are:

- a. Duster, Manual, Backpack - 3S762778A838.00.042
- b. Sprayer, Hand Portable, Ultra Low Volume (ULV) - 3S762778A838.00.043
- c. Pesticide Dispersal Unit, Liquid/Solid Backpack - 3S762778A838.00.044

Currently, thirteen commercially available portable backpack pesticide dispersal units have been identified, procured and are being evaluated for military applicability and durability. Bench and field evaluations are approximately 50% complete.

TITLE: Portable Pesticide Dispersal Equipment (Cont'd)

PROGRESS

A satisfactory unit will be identified at the conclusion of these evaluations.

Recommend that this work unit be maintained in the 838 program for the current fiscal year, and moved into the 836 or 832 program area during FY79.

REFERENCES

1. DF, DASG-HCL to USAMRDC, dated 4 June 1976, subject: Vector Control and Pesticide Dispersal Equipment.
2. Letter, SGRD-SDM to USAMBRDL, dated 21 June 1976, subject as above.
3. Letter, USAMBRDL(SGRD-UBH) to USAMRDC, dated 23 Aug 76, subject as above.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY ACTV*	6. WORK SECURITY*	DA 0B 6195	78 10 01	DD-DR&E(AR)636
77 10 01	D. CHANGE	U	U	NA	NL	
10. NO. /CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER
A. PRIMARY	62778A	3S162778A838		00		045 APC F774
B. CONTRIBUTING	XXXXXX	CARDS 114f				
11. TITLE (Punish each with security classification code)						
(U) Pesticide Dispersal Unit, Liquid, Helicopter Slung						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS*						
009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD		
7610	7909		DA	C. In-House		
17. CONTRACT/GRANT	EXPIRATION		18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS		20. FUNDS (In thousands)
A. DATES/EFFECTIVE:			PREVIOUS	0.5		50
B. NUMBER*			FISCAL YEAR	78		
C. TYPE:			CURRENT	1.5		48
D. AMOUNT:			79			
E. CUM. AMT.:						
21. RESPONSIBLE DOD ORGANIZATION			22. PERFORMING ORGANIZATION			
NAME* US Army Medical Bioengineering Research & Development Laboratory			NAME* US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS* Fort Detrick, Frederick, MD 21701			ADDRESS* Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL			PRINCIPAL INVESTIGATOR (Punish each with security classification code)			
NAME: Dettor, C.M., COL			NAME: Nelson, J.H.			
TELEPHONE: (301) 663-2434; AUTOVON 343-2434			TELEPHONE: (301) 663-7237; AUTOVON 343-7237			
23. GENERAL USE						
Foreign Intelligence Not Applicable						
24. KEYWORDS (Punish each with security classification code) (U) Helicopter Rig; (U) Liquid Dispersal; (U) Aerial Application; (U) Mosquito Control; (U) Liquid Insecticide						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 28. PROGRESS (Punish individual paragraphs identified by number. Proceed rest of each with security classification code.)						
23. (U) To identify a suitable commercial, helicopter slung, dispersal unit for applying liquid formulations of insecticides, which would: (a) be capable of dispensing liquid insecticides when slung beneath a helicopter; (b) require no modification of the aircraft; (c) be capable of applying adequate swath widths and deposition rates for controlling disease vectors in combat situations or CONUS.						
24. (U) A survey of commercially available, helicopter slung rigs will be made. Suitable units will be field evaluated. After entomological feasibility has been established, necessary modifications will be made and flight qualification tests coordinated with USAAVSCOM.						
25. (U) 7710 - 7809. The Simplex Model 2000 Liquid Spray Bucket available from Simplex Manufacturing Co., Portland, OR was identified as a suitable candidate to accomplish the objective. A unit was procured and modification evaluations were conducted. Several problems were encountered during field operations and it was determined that the unit was not satisfactory for military use. A Transland, Inc. unit was identified as a potential candidate and is being field tested in the Canal Zone during October-November 1978. If found to be suitable, the unit will be modified and subjected to developmental testing.						

DETAIL SHEET

TITLE: Pesticide Dispersal Unit, Liquid, Helicopter Slung

WORK UNIT NO: 045

AGENCY ACCESSION NO: DA OB 6195

PRINCIPAL INVESTIGATOR: Nelson, J. H.

BACKGROUND

A review by the SGO, of the available pesticide dispersal units, air and ground, has revealed that the mission of the Preventive Medicine Team LA, Entomology Service (TOE 8-620H) may be severely impaired by the lack of this dispersal equipment. A requirement, initiated by the SGO was sent to USAMRDC and ultimately to USAMBRDL for action to initiate a series of tasks to correct these deficiencies. The pesticide dispersal unit, liquid, helicopter slung is one of the tasks.

PROGRESS

A Simplex liquid unit was identified from technical literature. It was procured and modified for military use and was tested under field conditions. Several problems developed during these tests and the unit was eliminated from consideration to meet requirements. A Transland, Inc. unit was identified as an alternative candidate unit and was procured. Field tests are scheduled in the Canal Zone during Oct-Nov 1978. If these tests indicate the unit is satisfactory, it will be modified and subjected to Developmental Testing during 2nd Qtr FY78.

REFERENCES

1. DF, DASG-HCL to USAMRDC, dated 4 June 1976, subject: Vector Control and Pesticide Dispersal Equipment.
2. Letter, SGRD-SDM to USAMBRDL, dated 21 June 1976, subject: as above.
3. Letter, USAMBRDL (SGRD-UBH) to USAMRDC, dated 23 Aug 76, subject: as above.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ^c	6. WORK SECURITY ^c	7. REGRADING ^d	8. DOD/N INSTN ^e	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO./CODES ^f	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	62778A	35162778A838		00		046 APC F777	
B. CONTRIBUTING	XXXXXX	CARDS 114F					
11. TITLE (Provide with Security Classification Code) ^g (U) Development of a Water Purification Unit and Field Test for Pyrogen-Free Water							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ^h 002300 Biochemistry; 012100 Organic Chemistry; 009800 Medical and Hospital Equipment							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD				
7607	7910	DA	C. In-House				
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)	
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:		EXPIRATION: FISCAL YEAR		PROCEEDINGS CURRENT		25	
		E. AMOUNT: 79		0.3		00	
F. CUM. AMT.: 00							
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION		23. KEYWORD (Provide each with Security Classification Code) (U) Endotoxins; (U) Production of; (U) Assay for; (U) Pyrogen-Free Water; (U) Pharmacy			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		PRINCIPAL INVESTIGATOR (PIMA) OR U.S. ACADEMIC INSTITUTION NAME: Barkley, J.J. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				POC:DA			
24. GENERAL USE Foreign Intelligence Not Applicable							
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Provide test of each with Security Classification Code.)							
23. (U) To develop a water purification unit to be used within a field hospital pharmacy capable of producing waters for injection that meet United States Pharmacopeia (USP) Standards. To develop or adapt existing test procedures that are capable of verifying the quality of the water produced.							
24. (U) A simple, low maintenance water purification unit capable of producing pyrogen-free water will be tested for reliability. A short term storage system will be developed. A method for packaging individual 1-liter containers will be devised.							
25. (U) 7710 - 7809. A detailed literature search and a problem definition document was completed. An existing, FDA approved, <u>in vitro</u> assay has been adapted for determining pyrogenicity. The assay, known as the LAL test, is more rapid, sensitive and economical than the existing USP procedure. A unit utilizing deionization carbon absorption, micro-filtration, UV irradiation and ozonation has been found to be capable of producing 6 gallons/hour of pyrogen-free water. The reliability of the production system as well as the development of a short term storage system will be accomplished pending the availability of funds.							

DETAIL SHEET

TITLE: Development of a Water Purification Unit and Field Test for Pyrogen-Free Water.

WORK UNIT NO: 046

AGENCY ACCESSION NO: DA OB 6196

PRINCIPAL INVESTIGATOR: Barkley, J. J.

BACKGROUND

It has been recognized that a need exists for the production and verification of pyrogen-free water in field hospitals. The lack of this capability places an excessive burden on the logistics system and diminishes the level of medical care available to the field army.

PROGRESS

A literature search and a problem definition study have been completed.³ A Food and Drug Administration (FDA) approved in vitro assay for pyrogenicity has been adapted for field use. This assay, known as the Limulus Amebocyte Lysate (LAL) test, has proven to be more rapid, sensitive and economical than the previously used in vivo assay for pyrogenicity. A unit, capable of delivering six gallons per hour of pyrogen-free water has been developed. This system, made up of commercially available deionization, carbon absorption and micro-filtration columns and an ultra-violet, ozonization contactor, requires a minimum of water and electrical power; it is simple to operate and is economical to use. The treatment system converts potable water to deionized, de-chlorinated pyrogen-free water. The reliability of the system, a short-term storage system and a unit for preparing 1-liter units of pyrogen-free water is under study, and will be accomplished pending the availability of funds.

REFERENCES

1. Memorandum, HQDA, SGRD-OPM, 20 April 1978, subject: Joint Working Group held at US Army Medical Bioengineering Research and Development Laboratory, 22 March 1978.
2. Letter, HQDA, CDCMR-O, 21 February 1971, subject: Department of the

Army Approved Qualitative Material Development Objective for a Pyrogen Identifier, Rapid Response.

3. Barkley J. J., "Problem Definition Study: Production and Testing of Pyrogen-Free Water Under Field Condition," USAMBRDL-TR 7612, Ft. Detrick, MD., (Nov 1976).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION [*]	2. DATE OF SUMMARY [*]	REPORT CONTROL SYMBOL DD-DR&E(AR)636	
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY ACTY [*] U	6. WORK SECURITY [*] U	7. REGADING [*] NA	8. DRG'DN INSTN [*] NL	9. SPECIFIC DATA [*] CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
10. NO. CODES [*] A. PRIMARY 62778A	PROGRAM ELEMENT PROJECT NUMBER 3S162778A838			TASK AREA NUMBER 00	WORK UNIT NUMBER 047 APC F791		
11. TITLE (Print in full with Security Classification Code) (U) Bag, Aidman's, Redesign of							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical & Hospital Equipment							
13. START DATE 7705	14. ESTIMATED COMPLETION DATE 8002	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House				
17. CONTRACT/GANT	18. RESOURCES ESTIMATE PRECEDING	19. PROFESSIONAL MAN YRS FISCAL YEAR 78	20. FUND'S (in thousands) CURRENT 0.1	21. FUND'S (in thousands) 79 0.8 07			
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:	E. EXPIRATION: F. AMOUNT: G. CUM. AMT.:	22. PERFORMING ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701					
23. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				24. PRINCIPAL INVESTIGATOR (Print in full with Security Classification Code) NAME* O'Connor, R.J. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Arnold, M.F. NAME: POC:DA			
25. KEYWORDS (Print in full with Security Classification Code) (U) Air Bag; (U) Aidman; (U) Emergency Medical Treatment; (U) Field Medical Equipment; (U) Case, Medical Instrument and Supply							
26. TECHNICAL OBJECTIVE.* 2A. APPROACH, 2B. PROGRESS (Print in full individual paragraphs identified by number. Provide text of each with Security Classification Code)							
23. (U) To develop an improved aid bag for use by the platoon aidman.							
24. (U) Functional criteria for aid bags will be established. Several potential replacements will be designed, fabricated and evaluated. The best features of each model will be incorporated into a final design.							
25. (U) 7710 - 7809. Letter Requirement (LR) establishing functional criteria and principal characteristics for the two kit concept has been authenticated. Medical supplies in conformance to Annex A of the LR have been ordered and received. Bag configurations which will accommodate the medical supplies for the two kit concept are being developed.							
173							

* Available to contractors upon contractee's approval.

DD FORM 1498
1 MAR 68

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

* U.S. GPO: 1974-540-843/8691

DETAIL SHEET

TITLE: Bag, Aidman's, Redesign of

WORK UNIT NO: 047

AGENCY ACCESSION NO: DA OB 6215

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

During visits by members of the staff at USAMBRDL to Brave Shield XV and Jack Frost 77, complaints and suggestions were received regarding the M-3 and M-5 Aid Bags. This same situation was encountered on a US Army Materiel Systems Analysis Activity (AMSAA) team visit to Fort Lewis, Washington. As a result of these suggestions and complaints, USAMBRDL was tasked to initiate a study on Aid Bag Modifications.

In April 1977, USAMBRDL was tasked with a project to Redesign the Aidman's Bag. Information was gathered from various domestic and foreign sources concerning aid kits and the functions which they must serve.

The information was consolidated and reviewed by the Medical Department and the views of others outside the Medical Department were sought. A draft Letter Requirement (LR) was proposed and submitted for consideration in September 1977.

A Joint Working Group held in January 1978 reviewed the draft LR. A Letter Requirement (LR) was approved and authenticated in June of 1978.

PROGRESS

With the acquisition of the requirements document, medical supplies of the kind listed in Annex A of the LR were ordered.

Most of these supplies had been received by September 1978.

Various configurations of the two kit concept are currently being considered and a number of prototype bags have been fabricated.

REFERENCES

1. Letter, SGRD-SDM, dated 24 Jan 77, subject: M-5 Aid Kit Modification.
2. Letter, SGRD-UBZ, dated 17 Feb 77, subject: M-5 Aid Kit Modification.
3. Memorandum for Record, dated 19 Mar 1977, subject: Initial Standard for Aid Bags.
4. Letter, SGRD-UBE-G, dated 28 Apr 77, subject: Bag, Aidman's, Re-design of, Task No. A838.00.047.
5. Report of Visit, 7 June 77, to NARADCOM by Mr. R. J. O'Connor and 2LT R. G. Altman.
6. Memorandum for Record, dated 2 Aug 1977, subject: Meeting on Aid Bag Contents, 27 July 77, at USAMBRDL.
7. Letter, SGRD-UBH-O, dated 12 Aug 1977, subject: Improved Aid Bags.
8. Letter, SGRD-OPM, dated 19 Dec 1977, subject: Proposed Draft Letter Requirement (LR) for a Medical Set, Aid-Man.
9. Letter HSA-CDM, dated 13 June 1978, subject: Authentication of Letter Requirement for a Medical Set, Aidman (TRADOC ACN 38067).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ² DA OB 6234	2. DATE OF SUMMARY ³ 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)6236
5. DATE PREV SUMMARY 78 06 15	6. KIND OF SUMMARY K. COMPLETION	7. SUMMARY SECY ⁴ U	8. WORK SECURITY ⁵ U	9. REDRADING ⁶ NA	10. DISSTR INSTRN ⁷ NL	11. SPECIFIC DATA - CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
12. NO./CODES ⁸ a. PRIMARY 62778A	PROGRAM ELEMENT PROJECT NUMBER 3S162778A838			13. TASK AREA NUMBER 00	14. WORK UNIT NUMBER 048 APC F799	
b. CONTRIBUTING XXXXXX	CARDS 114(1)					
15. TITLE (Provide each with Security Classification Code) (U) Light, Surgical Operating, Field (NSN-6530-00-937-2204), Engineering Evaluation of 002400 Bioengineering; 009800 Medical and Hospital Equipment						
16. START DATE 7806		17. ESTIMATED COMPLETION DATE 7810		18. FUNDING AGENCY DA	19. PERFORMANCE METHOD C. In-House	
20. CONTRACT/GRAANT				21. RESOURCES ESTIMATE FISCAL YEAR PREVIOUS 78 CURRENT 79	22. PROFESSIONAL MAN YRS 0.1	23. FUNDS (in thousands) 02 00
a. DATES/EFFECTIVE: b. NUMBER: c. TYPE: d. KIND OF AWARD:	EXPIRATION: 4. AMOUNT: 5. CUM. AMT.					
24. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		25. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		26. PRINCIPAL INVESTIGATOR/PRINCIPAL RESEARCHER U.S. GOVERNMENT EMPLOYEE NAME: Conway, W.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Stup, J. NAME: POC:DA		
27. KEYWORD (Provide each with Security Classification Code) (U) Field; (U) Surgical Light; (U) Operating Light; (U) Field Operating Light						
28. TECHNICAL OBJECTIVE ⁹ ; 29. APPROACH; 30. PROGRESS (Provide individual paragraphs identified by number. Provide test of each with Security Classification Code)						
<p>23. (U) To evaluate and document field complaints concerning the field surgical lights to determine future course of action.</p> <p>24. (U) Conduct a survey of field complaints, conduct testing to verify complaints, conduct an in-house evaluation and prepare a final engineering evaluation report on the findings.</p> <p>25. (U) 7805 - 7809. Technical feasibility test phase has been completed and report forwarded to USAMRDC for consideration by the configuration control board.</p>						

DETAIL SHEET

TITLE: Light, Surgical Operating, Field (NSN 6530-00-937-2204), Engineering Evaluation of

WORK UNIT NO: 048

AGENCY ACCESSION NO: DA OB 6234

PRINCIPAL INVESTIGATOR: Conway, W. H.

BACKGROUND

This task is the first effort undertaken as part of the newly instituted Product Improvement Program for AMEDD. The initial effort involves an evaluation of complaints received against the item and conduct of a Technical Feasibility Test of proposed corrective actions. The task is then overviewed by a Configuration Control Board and decision made on the best method.

PROGRESS

Complaints against this equipment have been analyzed and testing conducted to verify their validity. The evaluation considered such factors as stability of the unit on uneven ground, structural stiffness of the assembly and the adequacy of the instruction manual. A number of options were developed to correct each fault and these were detailed, along with cost and schedule estimates, in a test report submitted to HQ/MRD for consideration by the Configuration Control Board. The task is considered complete. Future actions await the Board's conclusions and potential establishment of a work unit to proceed.

REFERENCES

1. Letter, US Army Medical Research and Development Command, Fort Detrick, Frederick, MD., SGRD-OP, dated 31 May 1978, subject: Light, Surgical Operating, Field (NSN 6530-00-937-2204).
2. Letter, US Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, dated 20 Sept 1978, subject: Technical Feasibility Test (PIP) on Surgical Operating Light.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁸	2. DATE OF SUMMARY ⁹	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ¹⁰	6. WORK SECURITY ¹¹	7. REGRADING ¹²	8A. DISP'DN INSTR'N	8B. SPECIFIC DATA: CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	9. LEVEL OF SUM A. WORK UNIT
78 06 15	D. CHANGE	U	U	NA	NL		
10. NO./CODES ¹³ PROGRAM ELEMENT		PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	62778A	3S162778A838		00		049	APC F798
B. CONTRIBUTING							
C. XXXXXXXXXX CARDS 114(f)							
11. TITLE (Provide with Security Classification Code) (U) Sink Service Unit (NSN 6545-00-019-9330), Engineering Evaluation of 002400 Bioengineering; 009800 Medical and Hospital Equipment							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ¹⁴		13. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD	
7806		7902		DA		C. In-House	
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE			
A. DATE/EFFECTIVE:		EXPIRATION:		PRECEDING		B. PROFESSIONAL MAN YRS	
B. NUMBER:				FISCAL YEAR	78	0.1	01
C. TYPE:		4. AMOUNT:		CURRENT	79	0.2	10
D. KIND OF AWARD:		E. CUM. AMT.:		19. PERFORMING ORGANIZATION			
20. RESPONSIBLE DOD ORGANIZATION				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
21. GENERAL USE Foreign Intelligence Not Applicable				PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. ARMY/DOE INVESTIGATING) NAME: O'Connor, R.J. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Crampton, K. NAME: POC:DA			
22. KEYWORD (Provide each with Security Classification Code) (U) Sink; (U) Service Sink; (U) MUST Service Sink; (U) Field Service Sink							
23. TECHNICAL OBJECTIVE, ¹⁵ 24. APPROACH, 25. PROGRESS (Furnish individual paragraphs identified by number. Precede text of each with Security Classification Code.)							
23. (U) To conduct an engineering evaluation of the sink service unit to determine feasibility of conducting a product improvement program or a maintenance work order action.							
24. (U) Prepare a test protocol to verify field complaints, conduct an in-house evaluation and prepare an engineering evaluation report so that a proper course of action can be determined.							
25. (U) 7806 - 7809. Information has been gathered on the procurement history of this item. A visual inspection of a sink service unit installed in an expandable (MUST) shelter was conducted. A unit was secured on loan for a detailed engineering evaluation.							

DETAIL SHEET

TITLE: Sink Service Unit (NSN 6545-00-019-9330), Engineering Evaluation of

WORK UNIT NO: 049

AGENCY ACCESSION NO: DA OB 6235

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

A letter was received from USAMRDC indicating that complaints have been received from the field regarding the performance of the sink service unit.

The nature of the complaint (component failure) suggested that the unit may be a candidate for product improvement or maintenance work order action.

PROGRESS

An inquiry was made of USAMMA for the complaint history on this unit. In addition its procurement history was secured from the Defense Personnel Support Center (DPSC).

An inspection of the sink service unit and the laboratory sink installed in a MUST expandable shelter at the 10th CSH at Fort Meade, MD was carried out.

The position and layout of the unit, the accessibility of the components, and the plumbing arrangement were noted.

A letter requesting the loan of a sink service unit for engineering evaluation and potential technical feasibility testing was sent to USAMMA in September 1978.

A unit has been received at USAMBRDL and a detailed inspection of the sink service unit and its component parts is underway.

REFERENCES

1. Report of Field Visit, USAMSA, Aberdeen Proving Ground, MD., Trip #78L01, 5-18 February 1978, page 4-8.
2. Letter, SGRD-OP, dated 22 May 1978, subject: Sink Service Unit (NSN 6545-00-019-9330, MFG: Hamilton Instrument Industry).
3. Letter, SGRD-UBE-G, dated 27 June 1978, subject: Sink Service Unit (NSN 6545-00-019-9330), Engineering Evaluation of, Task No. A838.00.017.
4. Report of Visit, dated 25 Aug 78, by Mr. R. J. O'Connor, to the 10th Combat Support Hospital, Fort Meade, MD.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ¹	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY 78 06 15	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY ³ U	6. WORK SECURITY ⁴ U	7. REGRADING ⁵ NA	8. DISCH'N INSTRN ⁶ NL	9. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES: A. PRIMARY 62778A				PROJECT NUMBER 35162778A838	TASK AREA NUMBER 00	11. LEVEL OF SUM A. WORK UNIT WORK UNIT NUMBER 050 APC F797
B. CONTRIBUTING XXXXXX CARD 114f						
12. TITLE (Provide with Security Classification Code) (U) Sterilizer, Field (NSN 6530-00-926-2151), Engineering Evaluation of						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment						
14. START DATE 7806	15. ESTIMATED COMPLETION DATE 7902	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRAANT A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:			19. RESOURCES ESTIMATE FISCAL YEAR PRECEDING 78 CURRENT 79	20. PROFESSIONAL MAN YRS 0.1 0.6	21. FUNDS (in thousands) 01 26	
22. RESPONSIBLE DOO ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			23. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
24. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434			25. PRINCIPAL INVESTIGATOR (Provide SSAN if U.S. Academic Institution) NAME: Patzer, N.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME: POC:DA			
26. KEYWORDS (Provide each with Security Classification Code) (U) Field Sterilizer; (U) Sterilizer; (U) Field Autoclave; (U) Field Equipment; (U) Portable Sterilizer; (U) Field						
27. TECHNICAL OBJECTIVE, 28. APPROACH, 29. PROGRESS (Provide individual paragraphs identified by number. Provide test or work with Security Classification Code)						
<p>23. (U) To conduct an engineering evaluation of the field sterilizer to investigate field complaints so that a determination can be made whether modifications should be conducted under a product improvement program or that a new product design is to be initiated.</p> <p>24. (U) Review and investigate problems and complaints, conduct an in-house evaluation of the sterilizer and technical manuals and issue a technical feasibility report.</p> <p>25. (U) 7807 - 7809. Problems and complaints have been reviewed with AMEDD National Maintenance Point and DLA Defense Personnel Support Center. The military specification drawings and manuals have been received for review. A technical feasibility test report is expected to be issued in the 1st Quarter FY79.</p>						

DETAIL SHEET

TITLE: Sterilizer, Field (NSN 6530-00-926-2151), Engineering Evaluation of

WORK UNIT NO: 050

AGENCY ACCESSION NO: DA OB 6236

PRINCIPAL INVESTIGATOR: Patzer, N.H.

BACKGROUND

Problems and complaints on the Field Sterilizer NSN 6530-00-926-2151 suggest that it is a candidate for a Product Improvement Program (PIP). On 27 June a work unit was established to conduct Technical Feasibility Testing (TFT) of the sterilizer.

PROGRESS

Visits were made to the AMEDD National Maintenance Point, Ft. Detrick and DLA Defense Personnel Support Center, Philadelphia to review: Item history, maintenance deficiencies, complaint history, procurement history and modification work orders. The military specification and latest modification, drawings, bills of material and manuals for the sterilizer have been requested and received. All of the above will be reviewed and a Technical Feasibility Test report is expected to issue in the 1st Qtr of FY 79.

REFERENCES

1. Letter, SGRD-OP, 30 May 1978, subject: Sterilizer, Field (NSN-6530-00-926-2151).
2. Letter, SGRD-UBE-G, 27 June 1978, Sterilizer, Field (NSN 6530-00-926-2151), Engineering Evaluation of, Task No. 838.00.050.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ⁴	6. WORK SECURITY ⁵	DA OB 6244	78 10 01	DD-DR&E(AR)636
A. NEW	U	U		NA	NL	7. REGRADING ⁶ 8. DISIN INSTRN ⁷ 9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	10. LEVEL OF SUM A. WORK UNIT	
B. PRIMARY	62778A	35162778A838		00	WORK UNIT NUMBER 051 APC F710	
C. CONTRIBUTING	KXXXXXXX	CARDS 114F				
11. TITLE (Provide with Security Classification Code) (U) Integrated Pest Management - Black Flies						
12. SCIENTIFIC AND TECHNOLOGICAL AREA ⁹ 005900 Environmental Biology; 002600 Biology						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7810	8209	DA		C. In-House		
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE		
A. DATES/EFFECTIVE:				PRECEDING	B. PROFESSIONAL MAN YRS	C. FUNDS (In thousands)
B. NUMBER ¹⁰				FISCAL YEAR	78	0.0
C. TYPE ¹¹				CURRENT	79	00
D. KIND OF AWARD ¹²				E. CUM. AMT.	2.2	77
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION		
NAME ¹³ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁴ Fort Detrick, Frederick, MD 21701				NAME ¹⁵ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁶ Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR /PUNYA BEAR II U.S. Academic Institution NAME: Hembree, S.C. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Kardatzke, J.T. NAME: Nelson, J.H.		
21. GENERAL USE Foreign Intelligence Not Applicable				POC:DA		
22. KEYWORD (Print in each with Security Classification Code) (U) Integrated Pest Management; (U) IPM; (U) Biological Control						
23. TECHNICAL OBJECTIVE ¹⁷ ; 24. APPROACH; 25. PROGRESS (Provide individual paragraphs identified by number. Provide last of each with Security Classification Code.)						
23. (U) To develop a method of long-term suppression of immature stages of black flies without adverse effect on the environment.						
24. (U) Growth regulator hormones or synthetic chemical analogues will be applied in the aquatic habitat in laboratory and field evaluations in such a manner to attach to specific substrates and with slow release action provide long lasting control. Attention will also be directed to the use of biological control agents including pathogenic protozoa, bacteria, and microsporidia. Insect pathogens on hand will be evaluated against black flies. Further, naturally occurring black fly pathogens will be collected and evaluated. Laboratory and field testing is required to develop methods for manipulation, storage, and application of these agents.						
25. (U) New work unit.						

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL	
				DA OB 6054	78 10 01	DD-DR&E(AR)636	
3. DATE PREV. SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRT	6. WORK SECURITY	7. REGRADING	8. DODIN INSTRN	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
77 10 01	K. COMPLETION	U	U	NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10. NO. /CODES	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	62778A	3S162778A838		00	101 APC F748		
B. CONTRIBUTING	62110A	3A162110A816		00	101		
XXANXKXKX CARD 114f							
11. TITLE (Provide with Security Classification Code)							
(U) Concentrator, Mosquito Larvae							
12. SCIENTIFIC AND TECHNOLOGICAL AREA: 009800 Medical and Hospital Equipment; 002400 Bioengineering; 005900 Environmental Biology							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD			
7504	7809	DA		C. In-House			
17. CONTRACT/GANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (In thousands)	
				PREVIOUS			
				FISCAL YEAR	0.1	04	
				CURRENT	79	0.0	
21. RESPONSIBLE DOD ORGANIZATION				22. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (FUNDING AGENT IF U.S. ARMY/DOE INVESTIGATING) NAME: Driggers, D.P. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Cranford, H.B. NAME: Desrosiers, R.E.			
23. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
24. KEYWORD (Provide each with Security Classification Code) (U) Larval Concentrator; (U) Mosquito Surveys; (U) Disease Vectors; (U) Population Studies; (U) Mosquito Habitats							
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Provide last of work with Security Classification Code.)							
23. (U) To develop a mosquito larval concentrator for use in mosquito larvae surveys for determination of population densities of potential disease vectors or pest mosquitoes that affect the health and morale of military and associated populations in CONUS and at overseas locations.							
24. (U) Design and fabricate prototype concentrators and evaluate.							
25. (U) 7710 - 7809. This task is terminated per recommendation of the Joint Working Group held at US Army Medical Bioengineering Research and Development Laboratory, 22 March 1978 (Letter SGRD-OPM, Department of the Army, US Army Medical Research and Development Command, Fort Detrick, Frederick, MD 21701, dated 20 April 1978, Subject: Joint Working Group held at US Army Medical Bioengineering Research and Development Laboratory, 22 March 1978) with completion of the technical report and a scientific publication. A recommendation has been forwarded to the Office of the Surgeon General for inclusion of this item as a component of the entomological collecting kit, field (NSN 6545-00-982-4121).							

DETAIL SHEET

TITLE: Concentrator, Mosquito Larvae

WORK UNIT NO: 101

AGENCY ACCESSION NO: DA OB 6054

PRINCIPAL INVESTIGATOR: Driggers, D. P.

BACKGROUND

A requirement was established by the U.S. Army Medical Research & Development Command (SGRD-SDM, 31 Mar 75) to develop a portable, break resistant, mosquito larvae concentrator for use during field mosquito larval surveys.

Initial prototypes were fabricated and field tested for efficacy. Engineering design drawings were also completed.

Close examination of initial prototypes and the results of developmental testing revealed several unsatisfactory characteristics of the initial prototypes.

The concentrator and its collecting vials were re-engineered to produce a more durable, sturdy, one-piece concentrator unit with a simplified collection system. All components of this prototype are standard, easily obtainable items which require considerably less hand tooling and machining to produce.

Initial developmental testing has been conducted with the new prototypes. Developmental field evaluations have proven the item to be satisfactory.

PROGRESS

The new prototype will satisfy the requirement as outlined in the basic proposal. A recommendation is being made to add this item to the Entomological Collecting Kit, Field (NSN 6345-00-982-4121).

TITLE: Concentrator, Mosquito Larvae (Cont'd)

1. Letter, SGRD-SDM, to USAMBRDL, dated 31 March 1975, subject: Proposed Entomological Tasks.
2. Minutes, DRB Meeting No. 76-7, SGRD-UBE, dated 29 January 1976, subject: Materiel Developmental Review Board.
3. Memorandum, USAMBRDL Engineering Evaluation Branch to Pest Management Systems Branch, dated 2 March 1976, subject: Developmental Test (DT-1) of Concentrator, Mosquito Larvae, Task No. 816.00.101.
4. Technical Report 7810, Concentrator, Mosquito Larvae, August 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6058	2. DATE OF SUMMARY# 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY ACTY# U	6. WORK SECURITY# U	7. REGRADING# NA	8. DISSEM INSTN# NL	9. SPECIFIC DATA: <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO 10. LEVEL OF SUM A. WORK UNIT
10. NO. CODES* X009800X000	PROGRAM ELEMENT 62778A	PROJECT NUMBER 35162778A838		TASK AREA NUMBER 00	WORK UNIT NUMBER 105 APC F752	
	11. CONTRIBUTING 62110A	3AT62110A816		00	105	
	CARDS 114F					
12. TITLE (Provide with Security Classification Code)* (U) Pesticide Dispersal Evaluation Set						
13. SCIENTIFIC AND TECHNOLOGICAL AREA# 009800 Medical and Hospital Equipment; 002400 Bioengineering						
14. START DATE 7504	15. ESTIMATED COMPLETION DATE 7909	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GANT		19. RESOURCES ESTIMATE	20. PROFESSIONAL MAN-YRS 0.4	21. FUNDS (in thousands) 17		
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	78	79	1.0	28
B. NUMBER:		CURRENT				
C. TYPE:	D. AMOUNT:					
E. KIND OF AWARD:	F. CUM. AMT.:					
22. RESPONSIBLE DOD ORGANIZATION		23. PERFORMING ORGANIZATION				
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Provide Name if U.S. Citizen Involved) NAME* O'Connor, R.J. TELEPHONE (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER				
24. GENERAL USE Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME: Nelson, J.H. NAME: Gula, P.R.				
25. KEYWORD (Provide Each with Security Classification Code) (U) Pesticide Dispersal; (U) Droplet Size; (U) Insect Control; (U) EPA Requirements						
26. TECHNICAL OBJECTIVE* 26. APPROACH, 26. PROGRESS (Provide one short paragraph identified by number. Provide last of work with Security Classification Code) 23. (U) To develop a pesticide field evaluation set capable of measuring ULV droplet size and total pesticide amounts applied by military dispersal equipment utilized in insect control operations at military installations in CONUS and overseas.						
24. (U) Review commercial or military sources and if search is unsuccessful, fabricate new equipment and field-evaluate for efficacy of design.						
25. (U) 7610 - 7709. Commercial particle size measurement systems have been evaluated which operate on the following general principles: direct optical measurement in the aerosol state; electrical sizing and counting after collection in an electrolyte liquid; piezo electric measurement of cumulative mass by frequency to voltage conversion. Combination of this work unit and work unit Real Time Field Measurement of Aerosols, DA OA 8079, has been implemented during FY77. Procurement action has been completed on the purchase of an optical imaging droplet spectrometer and data acquisition system. Comparisons of data collected using the spectrometer and the slide wave technique have been done. Additional calibration is being done to resolve discrepancies between the various sizing methods.						

DETAIL SHEET

TITLE: Pesticide Dispersal Evaluation Set

WORK UNIT NO: 105

AGENCY ACCESSION NO: DA OB 6058

PRINCIPAL INVESTIGATOR: O'Connor, R.J.

BACKGROUND

This work unit was initiated at the request of US Army Medical Research and Development Command (SGRD-SDM, 11 Apr 75) to develop a light-weight, transportable set capable of determining droplet sizes and amounts of pesticides a given piece of dispersal equipment may be distributing into the environment. Rationale for this work unit was because of the hazards inherent in pesticide dispersal operations; it is important that parameters be measured in order to maintain a judicious application of pesticides in a given area of operation. Failure to maintain close control over the operation can result in decreased efficiency of pest-cidal operations, direct hazards to operating personnel and environments, and damage to government owned vehicles and equipment.

After examination of aerosol measuring equipment based on light scattering methods, direct mass measurements, optical imaging, and direct collection and counting methods, it was decided that the instrument which would best meet present need was one based on optical imaging and which provided droplet size data in the form of an electronic display or print-out. As a result of this, an optical array droplet spectrometer with a data acquisition system was purchased which provides information on the various aerosol parameters of interest in vector control/pest management operations.

The vendor provided training in the operation of the instrument and it is currently undergoing extensive calibration and comparison test trials.

PROGRESS

The droplet size spectrometer has been used to measure the droplet size distribution from various sprayers in the laboratory and the results of these measurements were compared to those obtained using the slide wave technique.

TITLE: Pesticide Dispersal Evaluation Set (Cont'd)

At the present time there are unresolved discrepancies between the two methods and information which will help resolve the problem is being sought.

The optical array spectrometer is being sent back to the manufacturer for recalibration and checks on the software in its data acquisition system.

Contact has been established with a particle size measurement group at the National Bureau of Standards in Gaithersburg and efforts are underway for some cooperative experiments in droplet size measurement.

REFERENCES

1. Letter, SGRD-SDM, dated 11 Apr 75, subject: Proposed Entomological Tasks.
2. Test Report, MR 14-78, dated 20 Jun 78, subject: Comparison of Droplet Size Measurements between Aerosol Measuring Instruments.
3. Test Report, MR 15-78, dated 28 Jun 78, subject: Evaluation of droplet size measurement capability of PDS-300 (Particle Data System), printer, and 30 channel spectrometer probe, APC 0752.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6059	2. DATE OF SUMMARY# 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)836
3. DATE PREV SUMMARY 78 05 01	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY SECY# U	6. WORK SECURITY# U	7. REBRADING# NA	8. DISSEM INSTRN# NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES# A. PRIMARY 62778A	PROGRAM ELEMENT 62110A	PROJECT NUMBER 3A162778A838 3A162110A816		TASK AREA NUMBER 00	WORK UNIT NUMBER 106 APC F753	
11. TITLE (Provide with Security Classification Code) (U) Preventive Medicine (Entomology) Field Laboratory, Modular						
12. SCIENTIFIC AND TECHNOLOGICAL AREA 009800 Medical and Hospital Equipment; 002400 Bioengineering; 005900 Environmental Biology						
13. START DATE 7504	14. ESTIMATED COMPLETION DATE 8110	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE PRECEDING		19. PROFESSIONAL MAN YRS 0.2		
A. DATES/EFFECTIVE:	EXPIRATION	FISCAL YEAR 78	20. FUNDS (in thousands)		06	
B. NUMBER#		CURRENT				
C. TYPE:	D. AMOUNT:	79			00	
E. KIND OF AWARD:	F. CUM. AMT.:					
21. RESPONSIBLE DOO ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL						
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434						
23. GENERAL USE						
Foreign Intelligence Not Applicable						
24. KEYWORD (Check each with Security Classification Code) (U) Mobile Field Laboratory; (U) TOE 8-620H; (U) Entomology Laboratory Team; (U) Portable Unit						
POC:DA						

28. TECHNICAL OBJECTIVE, 29. APPROACH, 30. PROGRESS (Provide individual paragraphs identified by number. Precede text of each with Security Classification Code).

23. (ii) To provide a mobile field laboratory mod-

23. (U) To provide a mobile field laboratory module that will accommodate mission

23. (U) To provide a mobile field laboratory module that will accommodate mission oriented equipment and provide working space for personnel assigned to the Entomology Laboratory Teams as authorized by TOE 8-620H.

24. (U) Review available military mobile shelters and modify as required. If no suitable unit is available, design and fabricate a suitable module.

25. (U) 7710 - 7805. This task is terminated per recommendation of the Joint Working Group held at US Army Medical Bioengineering Research and Development Laboratory 22 March 1978 (Letter SGRD-OPM, Department of the Army, US Army Medical Research and Development Command, Fort Detrick, Frederick, MD 21701, dated 20 April 1978, Subject: Joint Working Group held at US Army Medical Bioengineering Research and Development Laboratory, 22 March 1978).

COMBAT MEDICAL MATERIEL
(Military Medical Materiel, Advanced Development)

35163732A836

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
				DA OB 6171	78 10 01	DD-DR&E(AR)636	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRT	6. WORK SECURITY	7. REGADING	8. DA DISSEM INSTN	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	63732A	35163732A836		00		004 APC F304	
KXXXXXXK	64717A	35164717D832		00		005	
XKKKKKKK	CARDS 114f						
11. TITLE (Print in block with security classification code)* (U) Selective Blood Screening Device							
12. SCIENTIFIC AND TECHNOLOGICAL AREA* 003500 Clinical Medicine; 009800 Medical and Hospital Equipment							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD				
7602	7912	DA	C. In-House				
17. CONTRACT/GANT		18. RESOURCES ESTIMATE					
A. DATES/EFFECTIVE:		B. PROFESSIONAL MAN YRS C. FUNDS (In thousands)					
B. NUMBER*		PROFESSIONAL					
C. TYPE		FISCAL YEAR 78 0.1 01					
D. AMOUNT		CURRENT					
E. CUM. AMT.		79 0.6 25					
19. RESPONSIBLE DOD ORGANIZATION							
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701							
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434							
20. PERFORMING ORGANIZATION							
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701							
PRINCIPAL INVESTIGATOR (Print in block with security classification code) NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:							
ASSOCIATE INVESTIGATORS NAME: Stup, J.L. NAME: POC:DA							
21. KEYWORD (Print in block with security classification code) (U) Counter; (U) Blood Cell; (U) Field; (U) Medical; (U) Blood Screening							
22. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Print in block paragraphs identified by number. Provide last of each with security classification code.)							
23. (U) To develop a Field Blood Cell Counter for future field military laboratory use.							
24. (U) Provide engineering assistance in the technical specification, source selection, and subsequent evaluation of a Field Blood Cell Counter.							
25. (U) 7710 - 7809. Solicitation published in the Commerce Business Daily by higher headquarters and proposals have been received. A Source Selection Board was convened during first quarter FY78 to review the proposals. The recommendation of the board was not to select a source and to suggest that the requirement for counting all the blood cell types be reconsidered. A draft LOA with the requirement for counting on red blood cells has been received for comment. It has been recommended that this requirement be considered as part of the field clinical analysis system.							

DETAIL SHEET

TITLE: Selective Blood Screening Device

WORK UNIT NO: 004

AGENCY ACCESSION NO: DA OB 6171

PRINCIPLE INVESTIGATOR: Salisbury, L. L.

BACKGROUND

The U.S. Army Medical Bioengineering R&D Laboratory was tasked on 20 January 1976 to evaluate a Field Blood Cell Counter developed in 1972 by the Beckman Instrument Company. The Beckman Counter did not meet the desired operational and maintenance criteria for field Army blood cell counters. A Technical Report addressing the various problem areas has been published.

Based on the engineering evaluation, a decision was made to develop a second generation field blood cell counter. Since several commercial organizations possess experience and capabilities in this area, an advertised solicitation was made and proposals received. The proposals address the development of an automatic device suitable for Army field use and capable of rapid and accurate counting of erythrocyte, leukocyte, and thrombocyte components of blood. A source selection board was convened during the first quarter of FY 78 for selection of contractor.

PROGRESS

The board questioned the requirement for counting erythrocytes in a field situation. The requirements document was returned to the combat developer for clarification. A draft LOA is being circulated which requires only counting erythrocytes. It has been recommended that blood cell counting be considered as part of the field clinical analysis system.

REFERENCES

1. Letter, SGRD-SDM, 20 Jan 76, subject: Field Blood Cell Counter (Proj. 832.49.053).
2. Letter, SGRD-SDM, 7 Apr 76, subject: Minutes and Recommendations of

Joint Working Group, 24-26 Mar 76.

3. Technical Report No. 7608, Engineering Evaluation of a Field Blood Cell Counter, Sept. 76, USAMBRDL.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6223	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCRTY# U	6. WORK SECURITY# U	7. REGADING# NA	8. DRIVEN INSTRN# NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES* A. PRIMARY 63732A	PROGRAM ELEMENT PROJECT NUMBER 3S163732A836	11. TASK AREA NUMBER 00		12. WORK UNIT NUMBER 005 APC F305		
B. CONTRIBUTING XXANXAMMNG	CARDS 1400A					
13. TITLE (Provide with Security Classification Code) (U) Pesticide Formulations, Controlled Release, Environmentally Compatible						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 005900 Environmental Biology; 002600 Biology						
15. START DATE 7710	16. ESTIMATED COMPLETION DATE 8209	17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House			
19. CONTRACT/GANT	EXPIRATION:	20. RESOURCES ESTIMATE FISCAL YEAR 78 CURRENT 79	21. PROFESSIONAL MAN YRS 0.8	22. FUNDS (In thousands) 47 82		
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:	E. AMOUNT: F. CUM. AMT.	23. PERFORMING ORGANIZATION NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
24. RESPONSIBLE DOO ORGANIZATION NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701 PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. GOVERNMENT SPONSORED) NAME: Nelson, J.H. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Anderson, L.M. NAME: Schiefer, B.A.				
25. KEYWORD (Provide each with Security Classification Code) (U) Pesticide Formulations; (U) Controlled-Release; (U) Pest Management; (U) Environmental Compatibility; (U) Vector Control						
26. TECHNICAL OBJECTIVE.* 26. APPROACH, 26. PROGRESS (Furnish individual paragraphs identified by number. Provide each with Security Classification Code.)						
23. (U) To identify and evaluate environmentally compatible controlled-release pesticide formulations of military relevance for use in support of tactical operations and fixed military installation pest management/vector control programs.						
24. (U) Utilizing commercially prepared controlled-release pesticide formulations and carriers potentially suitable for military use, quantify release rates and degradation rates in the laboratory. Those formulations found to be best in laboratory tests will be evaluated in field tests to verify laboratory results under natural environmental conditions. Determinations both in the laboratory and in the field will be biological effectiveness, environmental compatibility, cost effectiveness, and compatibility with current standard pesticide dispersal equipment.						
25. (U) 7710 - 7809. Five controlled-release pesticide formulations were identified and evaluations under laboratory conditions were initiated. Results of laboratory evaluations indicated all of the formulations are superior in duration of effectiveness over the presently utilized materials. One of the five formulations provided control of test specimens for 190 days (Altosid), one provided control for 214 days (Dursban) and the remaining three are providing 100% mortality of test specimens after 270 days.						

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* Available to contractors upon contractor's request

DD FORM 1 MAR 68 1498

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 68
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

* U.S. GPO: 1978-540-843/8691

DETAIL SHEET

TITLE: Pesticide Formulations, Controlled Release, Environmentally Compatible

WORK UNIT NO: 005

AGENCY ACCESSION NO: DA OB 6223

PRINCIPAL INVESTIGATOR: Nelson, J. H.

BACKGROUND

This task was officially assigned to USAMBRDL as a result of a Letter of Agreement (LOA) between the Combat Developer (Health Services Command) and the Materiel Developer (The Surgeon General). As stated in the LOA, an operational need exists for longer lasting and environmentally compatible pesticide formulations. Insect and rodent borne diseases have caused great losses in military manpower in the past and without adequate control can be expected to affect military operations in the future. The once relied upon long-lasting, broad spectrum pesticides like DDT and other organochlorine compounds have been cancelled, suspended or severely restricted in their usage. The current formulations of new compounds (organophosphates and carbamates) are short-lived and have a relatively short shelf life, thus are overall militarily less acceptable. These shortcomings can be overcome through the application of a controlled release environmentally degradable pesticide formulation.

PROGRESS

Five controlled release pesticide formulations were obtained and evaluations under controlled laboratory conditions were initiated. Results of these tests show all of the formulations tested are superior in duration of effectiveness over the presently utilized materials. One of the formulations (a developmental inhibitor - Altosid) provided control of test specimens for 190 days. A controlled release formulation of chlorpyrifos (an organophosphate) provided satisfactory control of test specimens for 214 days and the three remaining formulations are effecting 100% mortality in test specimens after 270+ days. A Cost and Operational Effectiveness Analysis (COEA) showed the use of controlled release silicate pesticide formulations to be greatly superior to presently utilized materials and methodology.

TITLE: Pesticide Formulations, Controlled Release, Environmentally Compatible (Cont'd)

REFERENCES

1. Letter, HSA-CDM, dated 15 August 1977, subject: Letter of Agreement (LOA) for Controlled-Release Environmentally Degradable Pesticide Formulations.
2. Letter, HSA-CDM, dated 26 May 1978, subject: Cost and Operational Effectiveness Analysis (COEA) of Available Mosquito Larvicide Options.

COMBAT MEDICAL MATERIEL
(General Combat Support, Engineering Development)

3S164717D832

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RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				5. AGENCY ACCESSION ⁵	6. DATE OF SUMMARY ⁶	REPORT CONTROL SYMBOL	
				DA OB 6069	78 10 01	DD-DRAE(AR)636	
3. DATE PHEW SUMMARY	4. KIND OF SUMMARY	5. SUMMARY ACTV ⁷	6. WORK SECURITY ⁸	7. REGRADING ⁹	8A. DISB'R INSTN'R	8B. SPECIFIC DATA - CONTRACTOR ACCESS	9. LEVEL OF SUM
78 05 01	H. TERMINATION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. CODES [*]	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	64717A	3S164717D832		00		001 APC F556	
B. CONTRIBUTING XXXXXXING	CARDS 1439D (03)						
11. TITLE (Provide each with Security Classification Code) (U) Mobile Incinerator, MUST, Evaluation of							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 005900 Environmental Biology							
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7507	7807		DA	C. In-House			
17. CONTRACT/GANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS		20. FUNDS (in thousands)	
A. DATES/EFFECTIVE:		EXPIRATION:		FISCAL YEAR	78 CURRENT	0.1	02
B. NUMBER:		C. AMOUNT:			79	0.0	00
D. TYPE:		E. CUM. AMT.:					
F. KIND OF AWARD:							
19. RESPONSIBLE DOD ORGANIZATION		20. PERFORMING ORGANIZATION					
NAME: US Army Medical Bioengineering Research & Development Laboratory		NAME: US Army Medical Bioengineering Research & Development Laboratory					
ADDRESS: Fort Detrick, Frederick, MD 21701		ADDRESS: Fort Detrick, Frederick, MD 21701					
PRINCIPAL INVESTIGATOR (PUNISH NAME IF U.S. Academic Institution) NAME: Prensky, W.C.							
TELEPHONE (301) 663-7277; AUTOVON 343-7277							
SOCIAL SECURITY ACCOUNT NUMBER:							
ASSOCIATE INVESTIGATORS NAME: Hodge, J.W.							
NAME: POC:DA							
21. KEYWORD (Provide each with Security Classification Code) (U) MUST; (U) Hospital; (U) Evacuation; (U) Combat Support; (U) Sanitation							
22. TECHNICAL OBJECTIVE, 23. APPROACH, 24. PROGRESS (Provide individual paragraphs identified by number. Provide each with Security Classification Code.)							
23. (U) To conduct an engineering evaluation of the prototype Mobile Incinerator to determine its optimum mechanical performance.							
24. (U) To prepare a test protocol which would encompass the required testing and forward a technical report on the results.							
25. (U) 7710 - 7804. No further testing was accomplished during this period. This work unit was recommended for termination at IPR, March 1978.							

DETAIL SHEET

TITLE: Mobile Incinerator, MUST, Evaluation of

WORK UNIT NO: 001

AGENCY ACCESSION NO: DA OB 6069

PRINCIPAL INVESTIGATION: Prensky, W. C.

BACKGROUND

This task was established in July 1975. The MUST Mobile Incinerator was previously evaluated in 1970-1971 at Fort Lee, Virginia, as part of testing of the MUST Waste Management System. Tests were aborted because of excessively high external temperatures (the surface of the loading door reached 202°F) and other mechanical problems. Another contract was awarded to AiResearch Corporation for redesign, but this was terminated before completion of design and any system testing. The unit was assembled and delivered to USAMRDC in November 1974.

After a test plan was submitted to SGRD-SDM, a 400 Hz Diesel Generator Set was acquired and isolated preliminary checkout of electrical circuits and components was completed. Ten incinerator burns were then initiated (with no waste materials) each of which was aborted in two to three minutes when the primary drum drive stopped and its motor circuit breaker disconnected. The problem was traced to interference of the labyrinth air seals caused by thermal expansion of the drum. An emergency repair has been made and complete 90 minute cycles were run successfully.

PROGRESS

Prior to the initiation of testing in accordance with the test plan, this work unit was recommended for termination by the IPR of March, 1978.

REFERENCES

1. Letter SGRD-UP, 20 Apr 1978, "Recommendations/Decisions of Joint Working Group, 22 Mar 1978".
2. Letter, SGRD-UBE, 22 May 1978, "Termination of Work Units".

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL
77 10 01	D. CHANGE	U	U	DA 0A 6283	78 10 01	DD-DRAE(AR)636
10. NO. /CODES. ⁴ PROGRAM ELEMENT				PROJECT NUMBER		11. LEVEL OF SUM
A. PRIMARY	64717A	35164717D832		00	A. WORK UNIT	
B. CONTRIBUTING						
C. XXXXXXXXX CARD 01490 (26)						
12. TITLE (Provide with security classification code) 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE 7303		14. ESTIMATED COMPLETION DATE 8010		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House	
17. CONTRACT/GANT				18. RESOURCES ESTIMATE		
A. DATES/EFFECTIVE: EXPIRATION:				FISCAL YEAR	PERSONNEL CURRENTLY 78	B. PROFESSIONAL MAN YRS 0.1
B. NUMBER: C. TYPE: D. AMOUNT: E. CUM. AMT.				79	04	C. FUNDS (\$ IN THOUSANDS) 49
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION		
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		
21. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				22. PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. ACADEMY INVESTIGATOR) NAME: Conway, W.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:		
23. GENERAL USE Foreign Intelligence Considered				ASSOCIATE INVESTIGATORS NAME: Crampton, K.T. NAME: POC:DA		
24. KEYWORD (Provide each with security classification code) (U) Cold Injury; (U) Frostbite; (U) Arctic Medicine; (U) Tissue Rewarmer						
25. TECHNICAL OBJECTIVE, ⁵ APPROACH, ⁶ PROGRESS (Furnish additional paragraphs commensurate to number provided test of each with security classification code)						
23. (U) To develop a device to be used by forward area medical units to rewarm frozen tissue by immersion or spray with aqueous solution of controlled temperature. Presently there is no satisfactory method of accomplishing this in the field.						
24. (U) Design and fabricate a breadboard prototype based upon previous engineering effort. Major technical barrier is to achieve required capability with desired lightweight characteristics.						
25. (U) 7710 - 7809. OT II testing was cancelled as a result of the findings of Customer Support Test performed by the US Army Cold Regions Test Center (patient electrical safety considerations). The requirements document is currently being revised to define a small lightweight rewarming device. A draft has been prepared and is being negotiated with the Academy of Health Sciences.						

DETAIL SHEET

TITLE: Cold Injury Rapid Rewarm and Treatment System, Prototype Design and Fabrication

WORK UNIT NO: 002

AGENCY ACCESSION NO: DA OA 6283

PRINCIPAL INVESTIGATOR: Conway, W. H.

BACKGROUND

The US Army Medical Bioengineering Research and Development Laboratory was tasked in July 1968 to develop a Cold Injury Rapid Rewarm and Treatment System. Due to lack of agreement, the required characteristics were not approved until 1971. Three (3) prototype devices were fabricated and went as far in the test cycle as OT II before it was discovered that a shock hazard was present and testing was discontinued. It was subsequently determined that the high power demands of the device made it unsuitable for use in forward areas and that the requirements on the device were unrealistic. At this time it was decided to begin again with a requirements document revised to define a small lightweight device.

PROGRESS

A new Letter Requirements document has been drafted and is currently being negotiated with the combat developer (Academy of Health Sciences).

REFERENCES

1. Department of the Army Approved Material Need (MN) (ED) (SDR) for Cold Injury Rapid Rewarm and Treatment System, November 1971.
2. Letter, SGRD-SDM, 12 March 1973, subject: Prototype Design and Fabrication - Cold Injury Rapid Rewarm and Treatment System.
3. Development Test (DT II) of Cold Injury Rapid Rewarm and Treatment System, Engineering Evaluation Branch, Technical Support Division, USAMBRDL.
4. Final Report, USACRTC, Customer Support Test of the Cold Injury Rapid Rewarm and Treatment System, dated 18 Mar 1977.
5. Letter, SGRD-SO-D, 4 May 1977, subject: Report of Decisions Reached at Formal in Progress Review.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY	6. WORK SECURITY	DA QB 6165	78 10 01	DD-DR&E(AR)836
77 10 01	D. CHANGE	U	U	NA	NL	7. REGRADING <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
8. NO. CODES PROGRAM ELEMENT PROJECT NUMBER				9. TASK AREA NUMBER		10. SPECIFIC DATA - CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
A. PRIMARY	64717A	35164717D832		00	003 APC F557	11. LEVEL OF SUMM A. WORK UNIT
B. CONTRIBUTING						
XXXXXX	CARDS 1670					
12. TITLE (Provide with Security Classification Code) (U) Hypodermic Injection Set, Jet, Automatic, Veterinary Medicine, Field						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 008800 Life Support; 009800 Medical and Hospital Equipment; 002600 Biology						
14. START DATE 7510	15. ESTIMATED COMPLETION DATE 7812		16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House		
18. CONTRACT/GANT A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:		EXPIRATION: F. AMOUNT: E. CUM. AMT.		19. RESOURCES ESTIMATE FISCAL YEAR PREDICTED 78 CURRENT 79	20. PROFESSIONAL MAN YRS 0.9 0.1	21. FUNDS (In Millions) 49 04
22. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			23. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
24. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434			25. PRINCIPAL INVESTIGATOR (Print in Block if U.S. Government Investigator) NAME: Ismach, A. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Malek, J.W. NAME: POC: DA			
26. KEYWORD (Provide Back with Security Classification Code) (U) Immunization; (U) Vaccination; (U) Animal; (U) Disease Control						
27. TECHNICAL OBJECTIVE, 28. APPROACH, 29. PROGRESS (Print individual paragraphs identified by number. Provide back with Security Classification Code)						
23. (U) To develop a family of hypodermic injection apparatuses for use in Army veterinary medicine (in mass immunization programs) for controlling animal-borne-diseases transmissible to man either directly or through other susceptible animals, thereby directly affecting the health of the soldier or reducing the supply of animal-provided food products.						
24. (U) Provide accessories to the standard items (FSN 6515-00-656-1021 and 6515-00-919-0097) to adopt apparatuses designed for human use making them suitable for veterinary use on animals. In addition, provide a backpack, hand-operated pump for use on large animals in pens. Complete the RDT&E initiated in completed Task 3A162110A816.00.037.						
25. (U) 7710 - 7809. DT II, OT II and Maintenance Evaluation were successfully accomplished and set is in process of being type classified as standard. A procurement package is in preparation (estimated completion date 17 Nov 1978).						

DETAIL SHEET

TITLE: Hypodermic Injection Set, Jet, Automatic, Veterinary Medicine, Field

WORK UNIT NO: 003

AGENCY ACCESSION NO: DA OB 6165

PRINCIPAL INVESTIGATOR: Ismach, A.

BACKGROUND

A Required Operational Capability (ROC) covers the development of a family of hypodermic jet injectors for veterinary use based on the need for controlling animal-borne-diseases transmissible to man either directly or through other susceptible animals. Such diseases impact on the Army by directly affecting the health of the soldier and by reducing the supply of animal-provided food products.

The developmental effort we initiated in January 1967 at the request of the Director, USAMBRL, WRAMC, to develop a veterinary jet injector for inoculation of drugs and biologicals in herd use, particularly for use with the experimental Venezuelan Equine Encephalitis (VEE) vaccine under development at Fort Detrick. In July 1967, USAMERDL shipped USAMBRL crowned nozzles, designed for use on furry animals without shaving, to be evaluated on the (human) foot powered injector (FSN 6515-910-0097) previously developed at USAMERDL. Clinical trials during 1967-1968 in Columbia, S.A. (by Dr. Stewart McConnell, LTC, VC) using above injector and VEE vaccine on over 2,000 animals and at Animal Farm, Fort Meade, on horses confirmed that VEE vaccine by jet injection is comparable to syringe-needle with regard to increases post-bleed over pre-bleed titers. The tests in Columbia by Dr. McConnell indicated need for a back packed unit to provide the operator with necessary freedom of movement.

In October 1969, with loss of investigator at USAMBRL, the R&D Command arranged for evaluation of the injector at the U.S. Department of Agriculture Plum Island Animal Disease Laboratory during their experimental studies of inactivated foot and mouth disease vaccines combined with various oil base adjuvants. Injectors functioned satisfactorily with these oil base adjuvants. USDA prepared a test protocol and requested permanent transfer of an injector to satisfy rigid isolation requirements at the Plum Island Laboratory. In November 1970, USDA submitted a test report indicating satisfactory results.

In June 1970, the R&D Command requested that the Project Engineer,

USAMERDL visit Dr. Stewart McConnell, now at the College of Veterinary Medicine, Texas A&M University, with a view toward a contract to completely evaluate the jet injectors for veterinary medicine. During latter part of 1970 and early 1971, a new 2 cc vaccine section was developed as well as a force intensifier which permitted this larger dose to be administered. In June 1971, a contract (DADA 17-71-C-1087) was awarded to Texas A&M University covering two phases: (1) evaluation of present equipment and required characteristics; (2) evaluation of prototype equipment under field conditions. The project engineer, USAMERDL, visited Texas A&M to deliver equipment and train operators in their use. During 1971-1973 the investigation at Texas A&M showed the complete feasibility of jet injection for veterinary use on both small and large animals, proved the feasibility of developing accessory equipment to convert the human injectors so that they are satisfactory for veterinary use and indicated again the need for a pack-packed mounted unit.

In August 1973, the project engineer demonstrated the feasibility of mounting and operating a foot-powered injector on a back frame. In September 1973, SGRD-SDM, established a work unit to develop a Veterinary Injection Apparatus, Backpack, Field. Such a device was designed, fabricated and tested at USAMERDL and was shipped to Texas A&M for clinical and field trials on 8 May 1974. During November 1973, crowned veterinary nozzles were fabricated in sufficient quantity to support clinical and operational testing. Two nozzle sizes were fabricated: (1) .005 inch diameter and (2) .009 inch diameter in accordance with optimum nozzle sizes determined for small and large animals by Dr. McConnell. Dr. McConnell reported in March 1975 of his successful field trials in Mexico where he employed the back pack injector under field conditions. He requested two minor improvements. In September 1975, Dr. McConnell reported successful use of the injector on cattle in Idaho, Oregon and Colorado. A rabies study which required deep extra muscular injections was added to the Texas A&M study.

During October 1975, USAMERDL was directed by SGRD-SDM to convert the program from exploratory development (6.2 funds) to category 6.4 for final development of a family of injectors. During March 1976 an IPR was held and minor corrections in weight and cube were approved to the ROC, dated 12 August 1975. At that time a foot-powered and a back-pack mounted unit was available. An electrical unit, described in the ROC, was not available since the standard electrical unit for human use (FSN 6515-656-1021) had insufficient hydraulic power to operate a unit with a 2 cc head and intensifier in place. On 7 April 1976 a purchase order was placed with Vernitron Medical Products to procure an electrical veterinary injector with increased electrical horsepower and increased hydraulic pressure capability. In addition, accessory lengths of hoses were obtained to permit increase of working radius of from 6 to 30 feet from the unit. Unit was delivered in May 1976.

During May - June 1976, arrangements were made to test a foot-powered and the electrical injector on thousands of swine (2 cc injections of

Eryspales Bacterin) using the Virginia Polytechnic Institute Extension Service. Exercise indicated that units were feasible for veterinary injection, however, the bottle holder required modification to securely hold the large bottles used in veterinary medicine (since accomplished) and the electrical injector was not as well tolerated by the nervous swine as the foot powered injector which had no high pitched motor noise associated with its operation. A back-packed injector was not available during these trials, but seemed to be the unit of choice.

During June 1976 work was initiated at USAMBRDL to fabricate an additional three back-packed units. In addition, five more electrical injectors were ordered from Vernitron Medical Products for delivery during October 1976.

During 1977, the prototypes were completed. A development plan was prepared in cooperation with USAMRDC. A DT II Test Plan was prepared and DT II Testing started. In a Joint Working Group (JWG) Meeting held 26-28 July 1977, a decision was made to revise the ROC to delete "family" and substitute "set". The electrical injector was not considered necessary for Army use. The set consists of an injector capable of foot operation or hand operation on a back-pack.

PROGRESS

The ROC was revised by a correspondence IPR. DT II testing was accomplished at USAMBRDL and the set passed all of the requirements. A maintenance evaluation was conducted by the National Maintenance Point, USAMMA. OT II testing was accomplished during February - May 1978 at Leavenworth, Kansas. Set was recommended for adoption with very minor changes. A technical data package has been initiated at USAMBRDL with completion due in early November 1978. The operator's manual has been revised to cover veterinary use. A Ph. D. dissertation by Dr. Howard Wayne Whitford, DVM, Texas A&M has been received and is available as a reference text in the use of the jet injector in veterinary medicine.

REFERENCES

1. Letter, USA Medical Biomedical Research Lab, dated 3 June 1967, subject: Jet Injection in Veterinary Medicine, Serial MEDEC-MERL.
2. Letter Progress Reports (No. 1 and No. 2), U.S. Department of Agriculture, Plum Island Disease Lab, dated 16 November 1970 and 14 May 1971.
3. Contract No. DADA 17-71-C-1087, Texas A&M University, dated 24 May 1971, subject: Jet Injection in Large Animal Medicine, Jet Injector Evaluation.
4. Letter, USAMRDC, dated 17 September 73, subject: Veterinary Injection Apparatus, Backpack, Field.

5. Required Operational Capability (ROC) for a Family of Hypodermic Injection Apparatuses, Jet, Automatic, Veterinary Medicine, Field, dated 12 August 1975.
6. Letter, USAMRDC, dated 2 October 1975, subject: Required Operation Capability (ROC) for a Family of Hypodermic Injection Apparatuses.
7. Minutes of Formal Special In-Process Review (IPR), 23,24 March 1976 prepared by USAMRDC (SGRD-SDM) on 7 April 1976.
8. Letter, Virginia Polytechnic Institute and State University, Cooperative Extension Service, dated May 19, 1976.
9. Letter, SGRD-RO-D, 18 June 1977, subject: "Family of Hypodermic Injection Apparatuses, Jet Automatic, Veterinary Medicine", with Inclosure Automatic, Veterinary Medicine, Field".
10. Letter, SGRD-UBE, 23 June 1977 and 1st Ind, SGRD-OPM, 8 August 1977, subject: "Family of Hypodermic Injection Apparatuses, Jet, Automatic, Veterinary Medicine, Field, with Inclosure DT II Test Plan".
11. Report of Visit, Joint Working Group Meeting, 27-28 July 1977, A. Ismach, USAMBRDL.
12. Plan of Evaluation; Hypodermic Injector Apparatus, Veterinary Medicine Field, 8 December 1977, MET&E, F.S.H., Texas.
13. DT II of Veterinary Jet Injection Apparatus, MR 16-77, 9 December 1977 and MR 11-78, 14 April 1978, USAMBRDL.
14. Report of Operational Test II (OT II), Hypodermic Injector Apparatus Veterinary Medicine Field (MET&E Project No. 21-77), dated 30 June 1978, MET&E, F.S.H., Texas.
15. "The Evaluation of Jet Injection for Use in Veterinary Medicine" - Doctor of Philosophy Dissertation, H.W. Whitford, Texas A&M, May 1976.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION #	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SURVEY	4. KIND OF SUMMARY	5. SUMMARY SECY	6. WORK SECURITY	DA OA 6282	78 10 01	DD-DR&E(AR)626
77 10 01	D. CHANGE	U	U	NA	NL	
7. NO./CODES	PROGRAM ELEMENT	PROJECT NUMBER		8. REGARDING	9. DOD/MIN INSTN	10. SPECIFIC DATA - CONTRACTOR ACCESS
A. PRIMARY	64717A	3S164717D832		00	004 APC F511	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
B. CONTRIBUTING	CARDS 114f					
11. TITLE (Provide with Security Classification Code)						
(U) Bag, Patient Holding and Evacuation, Prototype Design and Fabrication						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS						
009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7304	7910	DA		C. In-House		
17. CONTRACT/DRAFT						
18. DATES/EFFECTIVE:		EXPIRATION:		19. RESOURCES ESTIMATE		
				FISCAL YEAR	20. PROFESSIONAL MAN HRS.	21. FUNDS (in thousands)
				PREVIOUS	78	0.3
				CURRENT	79	0.5
				22. PERFORMING ORGANIZATION	US Army Medical Bioengineering Research & Development Laboratory Fort Detrick, Frederick, MD 21701	
NAME:		ADDRESS:		NAME:	ADDRESS:	
US Army Medical Bioengineering Research & Development Laboratory		Fort Detrick, Frederick, MD 21701		US Army Medical Bioengineering Research & Development Laboratory	Fort Detrick, Frederick, MD 21701	
23. RESPONSIBLE INDIVIDUAL						
NAME:		TELEPHONE:		PRINCIPAL INVESTIGATOR (PUNISH 304 IF U.S. Academy participating)		
Dettor, C.M., COL		(301) 663-2434; AUTOVON 343-2434		NAME: Prensky, W.C.		
24. GENERAL USE						
Foreign Intelligence Considered						
25. KEYWORD (Provide each with Security Classification Code)						
(U) Evacuation Bag; (U) Arctic Medicine; (U) Cold Climate Medical Material; (U) Patients, Transportation of						
26. TECHNICAL OBJECTIVE, 27. APPROACH, 28. PROGRESS (Punish individual paragraphs identified by number. Provide each with Security Classification Code.)						
23. (U) To develop a patient holding and evacuation system capable of maintaining casualties of desired, controlled temperatures in extreme cold climates for prolonged periods. Currently available evacuation bags cannot adequately maintain cold climate patients at required temperatures.						
24. (U) Design and fabricate developmental prototypes based upon previous engineering effort. Existing state-of-the-art materiel will be used. Major technical barrier is to achieve required temperature duration capability with required lightweight characteristics.						
25. (U) 7710 - 7809. The requirement for an electrically-powered liner has been eliminated because of a change in doctrine. Four new tubulated pads using silicon rubber instead of urethane tubing have been fabricated. The change in material is expected to eliminate a problem in "kinking" in cold storage which was encountered earlier. These pads will be tested with existing power units during cold-weather exercises in Alaska in January 1979.						
29. COMMENTS						
30. APPROVALS						
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DETAIL SHEET

TITLE: Bag, Patient Holding and Evacuation Prototype Design and Fabrication

WORK UNIT NO: 004

AGENCY ACCESSION NO: DA OA 6282

PRINCIPAL INVESTIGATOR: Prensky, W.C.

BACKGROUND

Present means for handling sick and injured personnel in northern operations are unsatisfactory. This task addresses the development of a heated patient holding and evacuation system for the handling of sick and injured personnel in cold environments. It is intended to resolve the existing operational deficiency posed by the lack of an adequate patient holding and evacuation bag.

This requirement was described in The Small Development Requirement (SDR) first proposed in July 1966 and approved 12 January 1971. In April 1973, USAMBRDL was tasked to initiate an in-house effort. Studies indicated that the initial development effort would benefit from work then current at NARADCOM on lightweight cold weather sleeping gear. USAMBRDL provided funds to NARADCOM in November 1973 to design and fabricate prototypes. These prototype bags and electrically-heated liners were designed, fabricated and tested using the environmental test facilities of USARIEM and USAMBRDL. The equipment did not satisfy the essential characteristics of the SDR. Although it may have been technically feasible to design such a system, factors such as cost, physical weight, and size restrictions made the resulting system impractical for field use. Based on this experience, the requirements document was reassessed and the minimum essential characteristics required of a patient holding and evacuation system determined.

A new Letter Requirement (LR) replaced the SDR. The LR was expanded to include other sources of supplemental heat which included electricity, propane or propylene gas and a Norwegian charcoal burner.

The leading candidate emerging from this work is a propylene gas catalytic heater which warms and pumps on ethylene glycol/water mixture through a tubulated liner within the evacuation bag. This system will be operationally tested in Alaska in January, 1979.

PROGRESS

The requirement for an electrically heated liner was eliminated through a change in doctrine which reassured that sufficient electrical power would not be available in locations where this device is most necessary. Several contracts were awarded for fabrication of new liners which would not "kink" in cold-storage. A new silicon-rubber, tubulated liner has been delivered and it will be tested with existing propylene gas-powered heaters in Alaska in January, 1979.

REFERENCES

1. Minutes of Formal Special In-Process Review (IPR), 21 March 1978 dated 30 March 1978; SGRD-OPM.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
78 05 01	D. CHANGE	U	U	DA 0B 6178	78 10 01	DD-DRA&E(AR)636
				3. REGRADING*	4. DISIN' INSTN#	5. SPECIFIC DATA - CONTRACTOR ACCESS
				NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
				6. LEVEL OF SUM	A. WORK UNIT	
				WORK UNIT NUMBER		
				00	005 APC F565	
				00	001	
				11. TITLE (Printed with Security Classification Code)		
(U) U.S. Army Hi-Speed Mini-Sterilizer						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS						
010100 Microbiology; 009800 Medical and Hospital Equipment						
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD	
7607		7910		DA	C, In-House	
17. CONTRACT/GRANT		18. EXPIRATION		19. RESOURCES ESTIMATE	20. PROFESSIONAL MAN YRS	
21. DATES/EFFECTIVE:		EXPIRATION		FISCAL YEAR	0.8	38
22. NUMBER:				CURRENT	0.3	12
23. TYPE:		24. AMOUNT:				
25. KIND OF AWARD:		26. CUM. AMT.:				
27. RESPONSIBLE DOD ORGANIZATION		28. PERFORMING ORGANIZATION				
NAME* US Army Medical Bioengineering Research & Development Laboratory		NAME* US Army Medical Bioengineering Research & Development Laboratory				
ADDRESS* Fort Detrick, Frederick, MD 21701		ADDRESS* Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (Printed with Security Classification Code)				
NAME: Dettor, C.M., COL		NAME: Prensky, W.C.				
TELEPHONE: (301) 663-2434; AUTOVON 343-2434		TELEPHONE: (301) 663-7277; AUTOVON 343-7277				
29. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER:				
Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS				
		NAME: Hodge, J.W.				
		NAME: Patzer, N.H.				
				POC:DA		
30. KEYWORD (Printed with Security Classification Code) (U) Sterilizing; (U) Field Equipment; (U) Medical; (U) Engineering Evaluation; (U) Field Sterilizers; (U) Emergency Sterilizer						
31. TECHNICAL OBJECTIVE,* 32. APPROACH, 33. PROGRESS (Printed individual paragraphs identified by number preceded by code with Security Classification Code.)						
23. (U) To conduct an engineering evaluation of an improved emergency sterilizer.						
24. (U) Conduct DT II and OT II testing on the second generation Mini Sterilizers.						
25. (U) 7805 - 7810. DT II and OT II have been completed and reports have been received. Minor problems have been identified; disposition awaits independent evaluations and IPR which are expected to occur by December 1978.						

DETAIL SHEET

TITLE: U.S. Army Hi-Speed Mini-Sterilizer

WORK UNIT NO: 005

AGENCY ACCESSION NO: DA OB 6178

PRINCIPAL INVESTIGATOR: Frensky, W. C.

BACKGROUND

This task was established in August, 1976 in conjunction with a contract awarded to the Castle Company to design and fabricate 12 units of a second-generation emergency sterilizer. The production run was completed early in 1978. This unit is now known as the U.S. Army Hi-Speed Mini-Sterilizer.

PROGRESS

During CY 1978, the production run was completed, test protocols for DT II and OT II were written and approved, DTII and OT II were completed and reports were written and distributed. The results were good with a few minor improvements indicated. Independent evaluations and IPR are expected before the end of CY 78.

REFERENCES

1. U.S. Army Hi-Speed Mini-Sterilizer, DT II Test Report MR 16-78 dated 31 July 1978 from Engineering Evaluation Branch, USAMBRDL.
2. Report of Operational Test II (OT II), U.S. Army Hi-Speed Mini-Sterilizer (Emergency Sterilizer), MET&E Project No. 20-75D dated 23 August 1978 from SGMMA-TD.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL	
				DA DA 6289	78 10 01	DD-DR&E(AR)636	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ³	6. WORK SECURITY	7. REGRADING ⁴	8A. DISPN INSTRN ⁵	8B. SPECIFIC DATA-CONTRACTOR ACCESS	9. LEVEL OF SUM
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. /CODES ⁶	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	64717A	35164717D832		00		008 APC F560	
B. CONTRIBUTING							
C. XERXXXXXXX	CARDS 1406R						
11. TITLE (Provide each with security classification code)							
(U) US Army Splint Set Case							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁷							
009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD			
7409	7906	DA		C. In-House			
17. CONTRACT/GRANT							
A. DATES/EFFECTIVE:	EXPIRATION:	18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)	
B. NUMBER:		FISCAL YEAR	PREVIOUS	78	0.2	15	
C. TYPE:	E. AMOUNT:	YEAR	CURRENT	79	0.1	04	
D. KIND OF AWARD:	F. CUM. AMT.	21. PERFORMING ORGANIZATION					
22. RESPONSIBLE DOD ORGANIZATION		NAME ⁸		US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS ⁹		ADDRESS ⁹		Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. GOVERNMENT INSTITUTION)		PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. GOVERNMENT INSTITUTION)			
NAME: Dettor, C.M., COL		NAME: O'Connor, R.J.					
TELEPHONE: (301) 663-2434; AUTOVON 343-2434		TELEPHONE: (301) 663-7277; AUTOVON 343-7277					
23. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER		ASSOCIATE INVESTIGATORS			
Foreign Intelligence Not Applicable		NAME: Cranford, H.B.					
		NAME:		POC:DA			
24. KEYWORD (Provide each with security classification code)							
(U) Field Equipment; (U) Splint Case; (U) Splint Set; (U) Leg Injury							
25. TECHNICAL OBJECTIVE, ¹⁰ 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Precede rest of each with security classification code.)							
23. (U) To redesign and improve reported deficiencies of the Roll Splint Set (NSN 6545-00-913-5675).							
24. (U) To design and fabricate a new case to eliminate deficiencies reported during earlier development and resubmit for evaluation.							
25. (U) 7710 - 7809. Testing (OT II) was conducted during the 1st Quarter of FY77 and a test report prepared. IPR convened in April 1977 and voted to submit the case to further operational testing. Further OT II testing was completed during 4th Quarter FY77. IPR convened in March 1978 voted to submit the case for type classification. Technical data package consisting of engineering drawings, proposed specification, and photographs were completed during 4th Quarter FY78.							

DETAIL SHEET

TITLE: U.S. Army Splint Set Case

WORK UNIT NO: 008

AGENCY ACCESSION NO: DA OA 6289

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

The U.S. Army Medical Bioengineering R&D Laboratory was assigned the task of redesigning and improving the deficiencies of the Roll, Splint, Set (NSN 6545-00-913-5675), some of the deficiencies which had been noted were:

1. The dimensions are not sufficiently large to accommodate any component longer than 30 inches long such as the leg splints.
2. To obtain components for use on a patient, the entire set must be unpacked and laid out flat.
3. Repacking of the components in the set during field conditions is difficult.
4. Due to the looseness of the flaps and straps after repacking, the smaller components can fall out during transport.

The Academy of Health Sciences, reference 4b, recommended development of a new Splint Set Case which would overcome the above deficiencies and have the following characteristics:

1. The case will be longer than the longest components and large enough to accommodate all components.
2. The case will have compartments or pockets on the sides to house the smaller components in a logical sequence. The larger components such as the splints will be stacked on their sides to facilitate ease in selection by combat medical personnel.
3. The case will have carrying straps on either side of the center at the top of the bag. These straps will be durable enough to transport the case with components under field conditions.
4. The case should be designed to allow the combat medic to locate

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ARMY MEDICAL BIOENGINEERING RESEARCH AND DEVELOPMENT --ETC F/G 6/5
US ARMY MEDICAL RESEARCH AND DEVELOPMENT REPORT.(U)
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necessary components in the shortest possible time without removing or disturbing the other components.

5. The case should be designed to allow combat medical personnel to repack the case quickly and in a logical sequence under adverse field conditions.

6. The case and any changes made to it should be able to withstand conditions and handling found in a field environment.

Development Tests (DT II) of two (2) prototypes were conducted during January 1976. There were no deficiencies or shortcomings found during these tests. A report, describing the details of test and the test data has been prepared. A drawing and technical data package of the prototype is complete.

A Formal In-Process Review, reference 4d, was held where it was concurred that the development effort should proceed to Operational Tests (OT II).

Having successfully completed the developmental efforts of this task, ten (10) prototypes of the Splint Set Case have been fabricated to be used during Operational Tests. Prototypes were shipped to the Medical Equipment Test and Evaluation, Academy of Health Sciences, Fort Sam Houston, Texas, during the first week of September 1976.

Operational Tests (OT II) were conducted during the period October through December 1976 and a report forwarded.

At the formal In-Process Review, the decision was made to have additional operational testing performed on the splint set case.

The splint set case was shipped to the Medical Equipment Test and Evaluation Division, AHS, Fort Sam Houston, Texas, June 1977.

Additional OT II testing was completed during 4Q FY 77.

PROGRESS

The report on the additional OT II testing of the case was reviewed and the case submitted for a maintenance evaluation. The mainentance evaluation was performed in January 1978 and the report submitted. At a formal In-Process Review convened in March 1978, it was noted that this item he recommended for type classification.

A technical data package consisting of engineering drawings, proposed specification, and photographs was completed in August 1978.

REFERENCES

1. Letter, SGRD-SDM, 27 January 1974, subject: Case, Splint Set, NSN: 6545-00-913-5675.
2. Letter, AHS-DMA, 25 April 1974, subject: Request for Improvement of Case, Splint Set.
3. Development Test of Case, Splint Set, 28 January 1976, USAMBRDL.
4. Letter, SGRD-SDM, 7 April 1976, subject: Minutes and Recommendations of Joint Working Group, 24-26 March 1976.
5. Letter Requirement (LR) for U.S. Army Splint Set Case, 18 February 1976.
6. Report of Operational Test (OT II), U.S. Army Leg Splint and Case (MET&E Project No. 9-76), 31 January 1977.
7. Minutes of formal In-Process Review (IPR), 21-22 April 1977, USAMBRDL.
8. Report of Operational Test # (OT II) and Supplemental OT II, U.S. Army Leg Splint and Case (MET&E Project No. 9-76), 27 Sept 1977.
9. Letter, SGMM-MP, dated 3 February 1978, subject: Maintenance Evaluation of U.S. Army Leg Splint and Case (with inclosure).
10. Minutes of formal In-Process Review (IPR), 21 March 1978, USAMBRDL.
11. Letter, SGRD-UBE, subject: Case, Splint Set, Telescopic Splints, Task No. D832.00.008, dated 31 August 1978

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL DD-DR&E(AR)636	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY ³	6. WORK SECURITY ³	7. REGARDING ⁸	8. DISSEM INSTNM	9. SPECIFIC DATA: CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
77 10 01	D. CHANGE	U	U	NA	NL		
10. NO./CODES [*] PROGRAM ELEMENT PROJECT NUMBER				TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	64717A	3S164717D832		00	009 APC F561		
B. CONTRIBUTING	XXXXXX	CARDS 1403R					
11. TITLE (Provide with security classification code) (U) US Army Leg Splint							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD				
7409	7906	DA	C. In-House				
17. CONTRACT/GANT							
A. DATES/EFFECTIVE:	EXPIRATION:						
B. NUMBER:							
C. TYPE:	4. AMOUNT:						
D. KIND OF AWARD:	E. CUM. AMT.						
18. RESPONSIBLE DOD ORGANIZATION				19. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (FURNISH NAME IF U.S. GOVERNMENT INVOLVED) NAME: O'Connor, R.J. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Cranford, H.B. NAME:			
20. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
21. KEYWORD (Provide each with security classification code) (U) Field Equipment; (U) Splint; (U) Leg Injury; (U) Medical							
22. TECHNICAL OBJECTIVE ⁶ ; 23. APPROACH; 24. PROGRESS (Furnish individual paragraphs identified by number. Provide test of each with security classification code.)							
23. (U) To redesign the Military Standard Splint, Leg, Thomas, Half-Ring, Aluminum (NSN 6515-00-372-5100) so that it may be used on individuals of all sizes and provide improved patient comfort.							
24. (U) Redesign the item IAW test and evaluation reports previously conducted, fabricate new prototypes and submit for evaluation.							
25. (U) 7710 - 7809. OT II was conducted during 1st Quarter FY77 and a report prepared. IPR convened in April 1977 recommended that the splints undergo additional operational testing. Additional OT II testing was completed during 4th Quarter FY77. The splint was recommended for type classification at the IPR convened in March 1978. Engineering drawings, proposed specifications and photographs were prepared. Technical data package was completed during 4th Quarter FY78.							

DETAIL SHEET

TITLE: U.S. Army Leg Splint

WORK UNIT NO: 009

AGENCY ACCESSION NO: DA DA 6286

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

The U.S. Army Medical Bioengineering R&D Laboratory was assigned the task of redesigning the Military Standard Splint, Leg, Thomas, Half-Ring (NSN 6515-00-372-5100) on 9 August 1973.

The objective of this task was to redesign the Leg Splint so that it may be used on individuals of all sizes and provide improved patient comfort. The principal modifications resulted from an Evaluation Report of the Brooke Army Medical Center in October 1972. The findings of the report indicated the following deficiencies:

1. The Thomas Half-Ring Leg Splint did not fit an individual over six (6) feet tall.
2. Padding on the leg splint was insufficient to provide comfort to the wearer or prevent the inhibition of normal blood flow to the limb.

Engineering redesign was completed and reviewed by a Development Review Board Meeting, February 1975. The following modifications addressed the problem-areas noted above:

1. The Leg Splint was increased in length to accommodate a fully dressed 95th percentile man. This redesign provided an additional 5 3/4 inches to the existing splint when fully extended. In the collapsed configuration, the modified splint is 1 1/2 inches longer than the existing splint.
2. The padding of the Thomas Leg Splint has been redesigned to provide a wider contact area of support to the leg, to provide softer material and thereby increase patient comfort.
3. As a result of in-house tests, the locking collar of the Thomas Leg Splint is being replaced with a more effective locking mechanism. This provides infinite adjustment of splint length as well as a more secure lock between the telescoping components.

4. Four straps, three inches wide made of canvas, were added to each prototype to be used to immobilize the limb. The straps are adjustable and have hook and loop (Velcro) material to act as closure device.

Development Test (DT II) were conducted with the modified leg splint. Initial results were satisfactory except for two areas of deficiency. The strap attached to the ischial pad did not support the necessary forces. The closed-cell vinyl foam of the ischial pad, although soft, did not have the desired toughness or resiliency. The problems were corrected by selection of new materials. The leg strap was made of nylon webbing and the ischial pad of closed-cell neoprene foam coated with polychloroprene. Retesting of these components was then completed.

During a Formal In-Process Review Meeting, it was agreed that the development effort proceed to Operational Test (OT II).

Having successfully completed the developmental effort of this task, twenty (20) prototypes were fabricated to be used during Operational Tests. Prototypes were shipped to the Medical Equipment Test and Evaluation, Academy of Health Sciences, Fort Sam Houston, Texas, during the first week of September 1976.

Operational Testing (OT II) of the splints was carried out during the first quarter of FY 77 (October through December 1976). A report of the operational testing was submitted to USAMRDC.

At the formal In-Process Review Meeting, it was agreed to resubmit the leg splint for additional operational testing.

The leg splints were shipped to the Medical Equipment Test and Evaluation Division, AHS, Fort Sam Houston, Texas, June 1977.

Additional operational testing fo the leg splint was completed during the 4Q FY 77.

PROGRESS

The test report on the additional operational testing of the leg splint was received during 1Q FY 78. The report was reviewed and the splint was submitted to the National Maintenance Point for a maintenance evaluation. The maintenance evaluation was performed and documented.

At a formal In-Process Review convened at USAMBRDL in March 1978, it was noted that the leg splint be recommended for type classification. A technical data package consisting of engineering drawings and proposed specifications was forwarded to USAMRDC in August 1978.

REFERENCES

1. Letter Requirement (LR) for U.S. Army Leg Splint, 18 February 1976.
2. Report of Evaluation, Medical Sets, Kits and Outfits, 16 October 1972, Medical Equipment Test and Evaluation, Brooke Army Medical Center, Fort Sam Houston, Texas.
3. Minutes of Development Review Board Meeting, 10 February 1975, USAMBRDL.
4. Evaluation of Prototype Army Leg Splint Report No. MR 13-76, USAMBRDL.
5. Minutes and Recommendations of Formal In-Process Review, 22-26 March 1976.
6. Report of Operational Test II (OT II), U.S. Army Leg Splint and Case (MET&E Project No. 9-76), 31 January 1977.
7. Minutes of formal In-Process Review (IPR), 21-22 April 1977, USAMBRDL.
8. Report of Operational Test II (OT II) and Supplemental OT II, U.S. Army Leg Splint and Case (MET&E Project No. 9-76), 27 Sept 1977.
9. Letter, SGMMA-MP, dated 3 Feb 1978, subject: Maintenance Evaluation of U.S. Army Leg Splint and Case (with inclosure).
10. Minutes of Formal In-Process Review (IPR), 21 March 1978, USAMBRDL.
11. Letter, SGRD-UBE-G, subject: Splint, Leg, Thomas, Half-Ring Task No. D832.00.009, dated 31 Aug 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁸	2. DATE OF SUMMARY ⁹	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY K. COMPLETION	5. SUMMARY SECY ¹⁰ U	6. WORK SECURITY ¹¹ U	DA OB 6155	78 10 01	DD-DR&E(AR)636	
				7. REGRADING ¹² NA	8. DA DISRM INSTR'N NL	9. SD SPECIFIC DATA ¹³ CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
						10. LEVEL OF SUM A. WORK UNIT	
10. NO./CODES ¹⁴ a. PRIMARY XRRNNNNNNX		PROGRAM ELEMENT 64717A CARDS 1404R		PROJECT NUMBER 351647170832		TASK AREA NUMBER 00	WORK UNIT NUMBER 010 APC F563
11. TITLE (Provide with Security Classification Code) (U) Dental Equipment Set, Light-Tray Unit, Field							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE 7507		14. ESTIMATED COMPLETION DATE 7906		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GANT				18. RESOURCES ESTIMATE		19. FUND'S (In thousands)	
a. DATES/EFFECTIVE:		EXPIRATION:		FISCAL YEAR	PRECEDING CURRENT	A. PROFESSIONAL MAN YRS 0.1	B. FUNDS (In thousands) 03
b. NUMBER ¹⁵		c. TYPE:		79	0.3	12	
d. KIND OF AWARD:		e. AMOUNT: F. CUM. AMT.					
20. RESPONSIBLE DOD ORGANIZATION				21. PERFORMING ORGANIZATION			
NAME ¹⁶ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁷ Fort Detrick, Frederick, MD 21701				NAME ¹⁸ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁹ Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNISH SEPARATE FROM INVESTIGATORS) NAME: Malek, J.W. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:			
22. GENERAL USE Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS NAME: Prensky, W.C. NAME: POC:DA			
23. KEYWORDS (Provide EACH with Security Classification Code) (U) Dental Portable Equipment; (U) Dental Field Sets; (U) Dental Operating Light; (U) Dental Field Equipment							
24. TECHNICAL OBJECTIVE, 25. APPROACH, 26. PROGRAM (Punish individual paragraphs identified by number. Provide each with Security Classification Code.)							
23. (U) To develop a dental light, tray and stool unit packaged in a field container, which will provide field dental personnel with a modern piece of equipment as a replacement for the Light, Dental Operating, Field (NSN 6520-00-074-4581), an adjustable tray for over-the-patient delivery of operating instruments and medicaments, and a stool for assistant operating personnel.							
24. (U) To fabricate a light pole and mounting bracket which is compatible with the Chair and Stool Unit, Dental Operating (NSN 6520-00-181-7349). The light, tray and stool components will be derived from presently type classified and/or currently available commercial source items. The set will be subjected to additional testing (operational and developmental).							
25. (U) 7610 - 7809. All developmental efforts have been completed. Technical data package (drawings and specifications) were prepared and forwarded for type classification action. Task to be held in an open status for future coordination with DPSC.							

DETAIL SHEET

TITLE: Dental Equipment Set, Light-Tray Unit, Field

WORK UNIT NO: 010

AGENCY ACCESSION NO: DA OB 6155

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

This task was established to update and improve field dental care. Currently, field personnel have been issued a new Dental Chair with Stool, but still use a Dental Light dating back to the 1950's. An over-the-patient delivery of instruments and medicaments is currently non-existent.

This task was initiated under the 816 (6.2) program and initial comments from field personnel were highly complimentary that data for the preparation of an Letter Requirement (LR) to develop this set was forwarded to the Combat Developer and Material Developer by the U.S. Army Medical R&D Command.

The LR was approved in April 1976 and a full scale development program was initiated. DT II and OT II were conducted and concluded during FY 77. Recommendation for type classification was approved at the IPR held in April 1977 provided satisfactory logistical evaluation was conducted. Logistical Evaluation was conducted by USAMMA in August 1977.

PROGRESS

With the successful conclusion to the Logistical Evaluation, detailed drawings and specifications were initiated and completed during FY 78.

In July 1978, the complete Technical Data Package for type classification and future procurement was forwarded to MRDC for transmittal. In Aug 1978, the Operational and Maintenance Manual was completed and forwarded for inclusion in the Technical Data Package.

REFERENCES

1. Letter, SGRD-SDD, 3 July 1975.

2. Letter, SGRD-UBE-G, 17 July 1975.
3. DT I Test Evaluation, USAMBRDL, 28 May 1976.
4. OT I Test Evaluation, USAIDR, 2 June 1976.
5. LR, HSA-CDM, dated 29 April 1976.
6. DT II Test Evaluation, USAMBRDL (MR 15-76) 30 Sept 1976.
7. OT II Test Evaluation, SGMMMA-TO, 7 Dec 1976.
8. Logistical Evaluation, SGMMMA-NMP, 20 June 1977.
9. Letter, SGRD-UBE-G, 27 July 1978, (Drawings and Specifications).
10. Letter, SGRD-UBE-G, 10 Aug 1978, (Operational and Maintenance Manual).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL DD-DR&E(AR)626	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRT ⁴	6. WORK SECURITY ⁵	7. REGRADING ⁶	8. DISP'N INSTRN ⁷	9. SPECIFIC DATA- CONTRACTOR ACCESS	10. LEVEL OF SUM- A. WORK UNIT
78 05 01	H. TERMINATION	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO./CODES ⁸	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	64717A	3S164717D832		00		011 APC F505	
B. CONTRIBUTING	XXXXXX	CARDS 149D (25)					
11. TITLE (Provide each with Security Classification Code) (U) Extractor, Medical Oxygen System, Individual Patient, System Design							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁹ 002400 Bioengineering; 008800 Life Support; 009800 Medical and Hospital Equipment							
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD			
7403	7809	DA		C. In-House			
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE			
A. DATES/EFFECTIVE:				B. PROFESSIONAL MAN YRS			
EXPIRATION:				C. FUNDS (in thousands)			
D. NUMBER:				FISCAL	78	0.3	15
E. TYPE:				YEAR	CURRENT		
F. CUM. AMT.					79	0.0	00
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory				NAME: US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS: Fort Detrick, Frederick, MD 21701				ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Provide name if U.S. Academy Institution)			
NAME: Dettor, C.M., COL				NAME: Cranford, H.B.			
TELEPHONE: (301) 663-2434; AUTOVON 343-2434				TELEPHONE: (301) 663-7277; AUTOVON 343-7277			
21. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER:			
Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS			
				NAME: NAME:			
22. KEYWORD (Provide each with Security Classification Code) (U) Oxygen; (U) Extractor; (U) Individual Patient; (U) Medical							
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Provide individual paragraphs identified by number. Provide code of each with Security Classification Code.)							
23. (U) To conduct an in-depth study in preparation of obtaining a system to extract oxygen from the atmosphere for an individual patient thus eliminating the need for bottled gas.							
24. (U) Analyze all currently known methods (operational and developmental) for producing and delivering medical oxygen at a patient's bedside or at an operating room table.							
25. (U) 7710 - 7804. No progress. Project terminated by In-Process Review 21 March 1978.							

DETAIL SHEET

TITLE: Extractor, Medical Oxygen System, Individual Patient, System Design

WORK UNIT NO: 011

AGENCY ACCESSION NO: DA OB 6050

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The work unit, Individual Patient Medical Oxygen System Extractor was established on 13 May 1974 (reference 2). The objective of the work unit is to recommend candidate system designs with the greatest potential of achieving the desired characteristics, stated in the Material Need Document (reference 1).

Technical literature was reviewed and manufacturers contacted to acquire pertinent data. During the course of the evaluation several trips were made to evaluate equipment and/or discuss technical approaches. Feasibility studies were performed in-house to evaluate two possible technical approaches (references 3 and 4). The data was presented before a Development Review Board Meeting, 10 February 1975 (reference 5). The conclusions stated that currently no commercial unit or one presently in the R&D phase can meet all of the Army's requirements (reference 1). The Army Aviation Command, Navy, and Air Force are currently funding R&D efforts to design and build similar types of equipment for aircraft on-board oxygen system. It was recommended that these programs be monitored so that the data generated would allow the USAMRDC to decide on the best system.

A proposed report was forwarded to USAMRDC (reference 7) requesting that the task remain open to monitor on-going R&D efforts. The request was approved (reference 8) with instructions to publish a Technical Report. The Technical Report (reference 6) was forwarded for approval by USAMBRDL on 27 June 1975 (reference 9).

A letter from the Academy of Health Sciences, 10 May 1976, (reference 10) stated the technology existed to meet the Army's requirements and proposed a concept formulation package and COEA. USAMBRDL replied (reference 11), it would be premature to attempt such action at this time due to insufficient data from the Navy and Air Force for R&D programs in the areas of safety, reliability, degradation, rates of chemicals, power, physical size and weight.

Two contractors presented briefings to the USAMRDC as to the capabilities of their oxygen generating equipment: AiResearch, 29 April 1976; and Bendix Corporation, 4 August 1976. Neither contractor has equipment that will meet all of the Army's requirements, although many of the requirements can be met.

Two Aircraft prototype units, under development by AiResearch, were examined by USAMBRDL personnel during the 8-9 September 1976 meeting between the Air Force and AiResearch (reference 12). USAMBRDL was an observer. The units do not meet all of the USAMRDC requirements at this time.

PROGRESS

The equipment under development for the Army, Navy, and Air Force Aircraft, can meet many of the requirements of reference 1. The area of greatest difficulty is the requirement for 99.5% O₂. The equipment that is capable is complex, power expensive, and not completely proven. The equipment that is capable of providing 90-95% O₂ is more reliable and in general requires less power. Project terminated at an IPR held on 21 March 78 (reference 16).

REFERENCES

1. Letter, United States Army Combat Development Command, Fort Belvoir, Virginia, CDCMS-O, 9 February 1974, subject: Department of the Army Approved Material Need (ED) (SDR) for an Extractor, Medical Oxygen System, Individual Patient, CDOG, Paragraph 149d (25).
2. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 13 March 1974, subject: Extractor, Medical Oxygen System, Individual Patient.
3. Small, Mitchell J., "Feasibility Study of the Production of High-Purity Oxygen from Air by a Solubility Differential Process:", Work Unit 5F505, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, 3 January 1975.
4. Small, Mitchell J., "Permeable Membrane Purification of Oxygen from Air", Project 5F505, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, 7 February 1975.
5. Meeting, Minutes of DRB, 75-3, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE, 10 February 1975, subject: "Engineering Division Development Review Board Meeting".

6. Cranford, H. Bruce, Jr., "Candidate Medical Oxygen Extractor System", TR 7505, DDC, AD-BO05719L, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, April 1975.
7. Letter, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, 12 May 1975, subject: Extractor, Medical Oxygen System, Individual Patient.
8. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 27 June 1975, subject: Extractor, Medical Oxygen System, Individual Patient, Work Unit 832.00.011.
9. Letter, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, 27 July 1975, subject: Extractor, Medical Oxygen System, Individual Patient, Work Unit 832.00.011.
10. Letter, Academy of Health Sciences, United States Army, Fort Sam Houston, Texas, HSA-CDM, 10 May 1976, subject: Evaluation of Alternatives for Satisfying the SDR for Oxygen Extractor, ACN: 16736.
11. Letter, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, 3 June 1976, subject: Evaluation of Alternatives for Satisfying the SDR for Oxygen Extractor, ADN: 16736, Task No. 832.00.011.
12. Trip Report, USAMBRDL, 8-9 September 1976, subject: To Attend USAF Sponsored Conference on Oxygen Extractor for the B-1 Bomber.
13. Trip Report, USAMBRDL, 12-13 October 1976, subject: To Observe and Evaluate Oxygen Equipment Developed for USAARC, Fort Rucker, Alabama, dated 21 October 1976.
14. Trip Report, USAMBRDL, 2 December 1976, subject: To Observe and Evaluate Oxygen Generating Equipment Developed for the Navy, Naval Air Development Center, Warminster, Pennsylvania, dated 8 December 1976.
15. Letter, USAMBRDL, SGRD-UBE-G, dated 18 February 1977, subject: Membrane Oxygenator.
16. Letter, SGRD-OPM, 30 March 1978, subject: Minutes of Formal Special In-Process Review (IPR), 21 March, 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY*	6. WORK SECURITY*	DA OA 6230	78 10 01	DD-DRA&R(AR)638
77 10 01	D. CHANGE	U	U	NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY	64717A	3S164717D832		00	012 APC F564	
B. CONTRIBUTING	XXXXXX	CARDS 1402R				
11. TITLE (Provide with Security Classification Code)* (U) Optometry Set, Field, Combat						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7405	7906	DA		C. In-House		
17. CONTRACT/GANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)
A. DATES/EFFECTIVE:		B. EXPENDITURE		C. CURRENT		26
B. NUMBER*		FISCAL YEAR	78	0.5		
C. TYPE:		CURRENT	79	0.6		25
E. KIND OF AWARD:		F. CUM. AMT.		21. PERFORMING ORGANIZATION		
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (PUNISH NAME IF U.S. Academic Institution) NAME: Cranford, H.B. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER:		ASSOCIATE INVESTIGATORS NAME: Patzer, N.H. NAME: POC:DA		
22. KEYWORD (Provide each with Security Classification Code)* (U) Field Set; (U) Field Optometry; (U) Combat Set; (U) Optometry Set						
23. TECHNICAL OBJECTIVE,* 24. APPROACH, 25. PROGRESS (Provide individual paragraphs identified by number. Provide text of each with Security Classification Code.)						
23. (U) To modernize and update the field optometry set and to replace components which are no longer available from commercial sources with new designs.						
24. (U) Design and fabrication of engineering development prototypes for Developing Test (DT II) and Operational Testing (OT II).						
25. (U) 7710 - 7809. Accessory container replaced with #3 and #6 field chests. Chair container and field chest passed OT II. Ft. Bragg, NC completed OT II. All components were acceptable except the chair. A replacement chair is being fabricated that meets all the requirements of the LR.						
*Available to contractors upon ordinator's approval.						

DETAIL SHEET

TITLE: Optometry Set, Field, Combat

WORK UNIT NO: 012

AGENCY ACCESSION NO: DA OA 6230

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The object of the Field Combat Optometry Set task is to update Set (NSN 6545-00-926-9061) and replace the Field Portable Ophthalmic Instrument Stand (NSN 6515-00-877-6460), which is no longer manufactured and the Portable Dental Operating Chair and Stool (NSN 6520-00-181-7349) which is unsatisfactory for ophthalmic examinations.

The Academy Health Sciences Draft LR was received by USAMBRDL and comments forwarded to USAMRDC (reference 1). Considerable discussion arose about the weights of the containers. AHS felt the weights of the two containers should be reduced to allow two man carry. USAMRDC and USAMBRDL felt the containers were designed in accordance with MIL-STD-1472 and the USAMRDC Draft LR. The containers require a four man carry and have sufficient handles for the purpose. USAMBRDL presented alternate designs to reduce weight of the containers, but none were acceptable to the Joint Working Group (reference 2). The Joint Working Group recommended the Draft LR with changes be approved and currently fabricated prototype Optometry Set undergo OT II.

The LR was approved on 4 June 1976 (reference 3). At that time the Task A816.00.023 was terminated and a new Task D832.00.012 Field Combat Optometry Set was established. Prototype fabrication of three units was completed in May 1976. The Development Test (DT II) Plan (reference 4) was written and later approved 10 August 1976 (reference 5).

The DT II was completed in December 1976 (reference 6). Several problems were uncovered, all but two were corrected prior to completion of tests. The chair container did not pass the rain test, and the accessory container did not pass the rain or drop tests. The design of the accessory container was based on the MUST linen containers (Chest, Medical Instrument and Supply Set NSN 6545-00-118-6249 which did not pass the same rain or drop tests and could not pass the tests (reference 7). USAMRDC decided not to modify the containers since OT II was scheduled for February 1977. In addition, it was concluded that the rain and drop test would not be repeated during OT II since the test had been performed during DT II.

The rain and drop tests could be repeated at a later date with very little effort, and would not delay OT II.

However, MET&E did not prepare the OT II Test Plan in time for the OT II. They were under the assumption the test could be rescheduled at any time after the OT II Test Plan was approved. MET&E discovered FORSCOM meets twice a year to schedule tests, once in March and again in October. Since MET&E missed the March meeting, they scheduled OT II at the October meeting for February 1978.

The maintenance evaluation was completed in March 1977 (reference 8). The manual was also completed in March 1977 (reference 9). USAMBRDL requested verbally, in August 1977, that the containers be redesigned to pass DT II prior to OT II. The OT II Test Plan was received in September 1977, reviewed and found to be adequate.(reference 10).

PROGRESS

Several alternate designs were examined to replace the accessory containers. The one chosen used two standard Field Chests, #3 NSN 6545-00-914-3480 and a #6 NSN 6545-00-914-3510 with special legs to convert the chests to 30 inch high tables (reference 11). In order for the Chair Shipping container to pass the rain tests, the rivets used in its construction, were sealed with a silicone sealant preventing seepage of water into the case. The container was retested, passing the rain test, thereby passing DT II (reference 13). Ft. Bragg, NC., conducted the OT II. All components were acceptable except the chair (reference 14). Several alternate actions were evaluated which resulted in the decision to use the dental chair with modifications, which is currently under development (reference 15). This was possible because several requirements specified in reference 16 were relaxed without affecting the LR (reference 3).

REFERENCES

1. Memorandum, USAMBRDL, SGRD-UBE-G, 28 January 1976, subject: Optometry Set, Field Combat, Task No. A816.00.023.
2. Letter, USAMRDC, SGRD-SDM, 7 April 1976, subject: Minutes and Recommendations of Joint Working Group (JWG), 24-26 March 1976.
3. Letter, Academy of Health Sciences, Fort Sam Houston, Texas, HSA-CDM, 4 June 1976, subject: Letter Requirements (LR) for an Optometry Set, Field Combat.
4. Cranford, H. Bruce, Jr., Development Test Plan (DT II) Field Combat Optometry Set, Task No. D832.00.012, USAMBRDL, Fort Detrick, Frederick, MD, July 1976.

5. Letter, USAMRDC, SGRD-SDM, 10 August 1976, (12 July 76) 1st Ind., subject: Field Combat Optometry Set.
6. Hodge, J. W., et al., Development Test (DT II) of Field Combat Optometry Set, Task No. D832.00.012, MR 17-76, 9 December 1976, USAMBRDL
7. Hodge, J. W., et al., Optometry Set, Field Accessory Case, Rain Test, MR 5-77, 12 April 1977, USAMBRDL.
8. Letter, subject: Maintenance evaluation of Optometry Set, Field, Combat and Container, Shipping Multipurpose, Canine, DA USAMMA, 8 Mar 77.
9. Letter, subject: Optometry Set, Field, Combat, Task No. D832.00.012, USAMRDC, SGRD-UBE-G, 9 Mar 1977.
10. Letter, subject: Plan of Operational Test II (OT II), Field Combat Optometry Set (MET&E Project No. 8-77), Task No. 832.00.018, USAMBRDL, SGRD-UBE-G, 28 Sept 1977.
11. Cranford, H. B., Trip Report, subject: To Discuss Replacement for Optometry Set Accessory Containers and Provide Comments on LR for Optometry Set, Field Combat Augmentation Set, Dated 29 Nov 1977.
12. Hodge, J. S., et al., Accessory Containers (No. 3 and No. 6 Medical Chests), Test Report, MR 1-78, 25 Jan 1978, USAMBRDL.
13. Hodge, J. W., et al., "Optometry Set, Chest Container, Rain Test", MR 18-77, 14 December 1977, USAMBRDL.
14. Department of Army, HQ & Support Co, 307 Medical Battalion 82nd Airborne Division, Ft. Bragg, NC. 28307, "Report of Operational Test II Field Combat Optometry Set MET&E Project No. 8-77, 20 April 1978.
15. Meeting, subject: Review of deficiencies of Field Combat Optometry Set encountered during OT II, 25 August 1978, Col Giroux, MAJ Sampson, B. Cranford.
16. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 2 May 1974, subject: Optometry Set, Field Combat (FSN 6545-00-926-9061).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION	2. DATE OF SUMMARY	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRT	6. WORK SECURITY	DA OA 6205	78 10 01	DD-DR&E(AR)636
78 01 16	H. TERMINATION	ON U	U	NA	NL	7. REGRADING <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
8. NO./CODES*	PROGRAM ELEMENT	PROJECT NUMBER		9. TASK AREA NUMBER	10. WORK UNIT NUMBER	
A. PRIMARY	64717A	3S164717D832		00	013 APC F541	
B. CONTRIBUTING	XXXXXX	CARDS T439D (03)				
11. TITLE (PUNISH with Security Classification Code) (U) Sanitation Complex (Evacuation and Combat Support Hospital)						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 008800 Life Support; 007800 Hygiene and Sanitation						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7405	7810	DA		C. In-House		
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS		20. FUNDS (in thousands)
A. DATES/EFFECTIVE: B. NUMBER: C. TYPE: D. KIND OF AWARD:		EXPIRATION	FISCAL YEAR	78 CURRENT	0.1	05
		E. AMOUNT:	79	0.0	00	
21. RESPONSIBLE DOO ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (PUNISH NAME if U.S. Affiliate institution) NAME: Patzer, N.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: NAME:				
23. GENERAL USE Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME: Crampton, K.T. NAME:		POC:DA		
24. KEYWORDS (PUNISH EACH with Security Classification Code) (U) MUST; (U) Hospital; (U) Evacuation; (U) Combat Support; (U) Sanitation						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Punish individual paragraphs identified by number. Precede text of each with Security Classification Code.) 23. (U) To evaluate and comment on the contractor's effort to design and fabricate a sanitation complex (latrine, washroom and shower facilities and waste incinerator) in accordance with the requirements of the QMR. This sanitation complex is intended for use by US Army Medical Field units. To modify prototype in accordance with recommendations and evaluate.						
24. (U) Compare the contractor's configuration to the requirements of the QMR and modify the prototype to meet the requirements.						
25. (U) 7710 - 7809. Final report on human waste incinerators completed and submitted. Project recommended for termination by IPR, March 1978.						

DETAIL SHEET

TITLE: Sanitation Complex (Evacuation and Combat Support Hospital)

WORK UNIT NO: 013

AGENCY ACCESSION NO: DA OA 6205

PRINCIPLE INVESTIGATOR: Patzer, N. H.

BACKGROUND

In April of 1974 a task was assigned to evaluate the contractors effort on the MUST Sanitation Complex. The complex has four major units; Lavatory, Shower, Toilet and Human Waste Incinerator.

PROGRESS

In 1976, 1977 and 1978 the Lavatory and Shower elements were tested modified and retested. Two different Human Waste Incinerators were tested during the same periods. In March of 1978 an IPR was held at USAMBRDL, Ft. Detrick, Maryland. The project was recommended for termination with an orderly transfer of technical data and information on work to date to DARCOM and interested agencies.

REFERENCES

1. Letter, SGRD-SDM, 19 April 1974, subject: Sanitation Complex (Evaluation and Combat Support Hospital).
2. Letter, SGRD-UBE-G, 28 June 1974, subject: Sanitation Complex (Evaluation Report).
3. Letter Report, SGMMA-TD, 6 May 1977, subject: Operational Test II (OT II), Shower and Lavatory Elements of MUST Sanitation Complex (MET&E Project No. 18-75).
4. Letter, SGRD-OPM, 30 Mar 1978, subject: Minutes of In-Process Review (IPR), 21 March 1978.
5. Letter, SGRD-UBE-G, 9 August 1978, subject: Sanitation Complex, MUST, Task No. D832.00.013, (MR 11-77, Evaluation Report, MR 13-78).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
				DA OB 6190	78 10 01	DD-DR&E(AR)636
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	7. REGRADING*	8. DESPN INSTRN	9. SPECIFIC DATA
78 06 15	D. CHANGE	U	U	NA	NL	CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		11. LEVEL OF SUM
A. PRIMARY	64717A	3S164717D832		00		12. WORK UNIT
B. CONTRIBUTING	62778A	3S162778A838		00		014 APC F566
XX-XXXXXX CARD 1213R						041
13. TITLE (Printed with Security Classification Code)						
(U) Pesticide Dispersal Unit, Solid, Helicopter Slung						
14. SCIENTIFIC AND TECHNOLOGICAL AREA*						
009800 Medical and Hospital Equipment; 002400 Bioengineering						
15. START DATE	16. ESTIMATED COMPLETION DATE		17. FUNDING AGENCY	18. PERFORMANCE METHOD		
7610	8106		DA	C. In-House		
19. CONTRACT/GANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN YRS		22. FUNDS (In thousands)
A. DATES/EFFECTIVE:		EXPIRATION:		FISCAL YEAR	PREVIOUS	
B. NUMBER*				CURRENT	78	0.6
C. TYPE:		4. AMOUNT:		CURRENT	79	49
D. KIND OF AWARD:		5. CUM. AMT.:		CURRENT	1.4	41
23. RESPONSIBLE DOO ORGANIZATION				24. PERFORMING ORGANIZATION		
NAME* US Army Medical Bioengineering Research & Development Laboratory				NAME* US Army Medical Bioengineering Research & Development Laboratory		
ADDRESS* Fort Detrick, Frederick, MD 21701				ADDRESS* Fort Detrick, Frederick, MD 21701		
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Printed with Security Classification Code)		
NAME: Dettor, C.M., COL				NAME: Nelson, J.H.		
TELEPHONE: (301) 663-2434; AUTOVON 343-2434				TELEPHONE: (301) 663-7237; AUTOVON 343-7237		
25. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER:		
Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS		
				NAME: Cranford, H.B.		
				NAME: Hembree, S.C.		
				POC:DA		
26. KEYWORD (Printed with Security Classification Code) (U) Helicopter Rig; (U) Solid Dispersal; (U) Aerial Applications; (U) Mosquito Control; (U) Solid Insecticide						
27. TECHNICAL OBJECTIVE* 28. APPROACH, 29. PROGRESS (Printed individual paragraphs identified by number. Printed last of each with Security Classification Code)						
23. (U) To identify a suitable commercial, helicopter slung, dispersal unit for applying solid formulations of insecticides, which would: (a) be capable of dispersing insecticides when slung beneath a helicopter; (b) require no modification of the aircraft; (c) be capable of applying adequate swath widths and deposition rates for controlling disease vectors in combat situations or CONUS.						
24. (U) A Simplex spreader was evaluated with various pesticide formulations under a variety of conditions and was found to be unsatisfactory due largely to the vertically actuated gate system. A Chadwick, Inc. applicator, with horizontally actuated gate system, was procured and modified for remote control operation. Feasibility and military adaptability will be established under field conditions.						
25. (U) 7806 - 7809. The Chadwick applicator has been evaluated under static tests and has proven to be operationally superior to the Simplex unit. The Chadwick unit will be field tested in the Canal Zone during October 1978 and has been scheduled for operational testing at Fort Bragg, NC during June 1979.						

DETAIL SHEET

TITLE: Pesticide Dispersal Unit, Solid, Helicopter Slung

WORK UNIT NO: 714

AGENCY ACCESSION NO: DA OB 6190

PRINCIPAL INVESTIGATOR: Nelson, J. H.

BACKGROUND

A need was established in June '76 to provide medical service personnel, engaged in field operations and installation pest management programs, with the capacity for aerial dispersal of solid (i.e., granules, dust, pellets) pesticides for the control of arthropod disease vectors and pest insects. A commercially available spreader (Simplex, Inc.) was procured, modified, and feasibility tested at two locations under varied ecological conditions. Although the unit proved to be feasible and adaptable to military use, its shortcoming was in the vertically actuated gate system which would not allow complete closure or dispersal shut down when used to dispense highly dense pesticide formulations. Another applicator which possesses a horizontally actuated gate system was procured and modified for remote control operation. Ground tests have shown the unit is capable of satisfactorily dispensing highly dense pesticide formulations. A Letter Requirement (LR) between the Combat Developer (Health Services Command) and Materiel Developer (The Surgeon General) for this project was approved in March 1978. Feasibility testing will be accomplished during October-November 1978 under actual field conditions. Operational Testing (OTI) has been scheduled with the 714th Preventive Medicine Detachment, Fort Bragg, NC, for June 1978.

CONCLUSIONS

The Chadwick, Inc. applicator has been shown to be operationally superior to the Simplex unit under static test conditions. The unit has demonstrated the necessary potential as a militarily adaptable item for use in dispersal of solid pesticide formulations.

TITLE: Pesticide Dispersal Unit, Solid, Helicopter Slung (Cont'd)

Recommend that the applicator be field tested during 1st Qtr FY79 to determine its capability in dispersal of a variety of solid pesticide formulations under actual field conditions. Following completion of field tests, the unit be transferred to Fort Bragg, NC, for FORSCOM OTI testing.

REFERENCES

1. DF, DASG-HCL to USAMRDC, dated 4 June 1976, subject: Vector Control and Pesticide Dispersal Equipment.
2. Letter, SGRD-SDM to USAMBRDL, dated 21 June 1976, subject: as above.
3. Letter, USAMBRDL (SGRD-UBH) to USAMRDC, dated 23 Aug 76, subject: as above.
4. Letter Requirement, dated 7 Apr 78, subject: Letter Requirement for Helicopter Slung Pesticide Dispersal Unit.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁹	2. DATE OF SUMMARY ⁹	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SCITY U	6. WORK SECURITY U	7. REGRADING NA	8. DISC'DN INSTRNM NL	9. SPECIFIC DATA CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
						10. LEVEL OF SUM A. WORK UNIT
10. NO. CODES: a. PRIMARY XXXXXX XXXXXX XXXXXX		PROGRAM ELEMENT 64717A 63732A CARDS 114f		PROJECT NUMBER 3S164717D832 3S163732A836	TASK AREA NUMBER 00 00	WORK UNIT NUMBER 015 APC F568 003
11. TITLE (Provide with Security Classification Code) (U) Environmental Protection Containers for Medical Supplies						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE 7409		14. ESTIMATED COMPLETION DATE 8001		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House	
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS 0.4	20. FUNDS (In thousands) 21	
21. DATES/EFFECTIVE:		22. EXPIRATION:		FISCAL YEAR 78	23. PERFORMING ORGANIZATION	
24. NUMBER: C. TYPE:		25. AMOUNT:		CURRENT 79	26. PRINCIPAL INVESTIGATOR (PUNIC NAME IF U.S. Army/DoD Staffing) NAME: O'Connor, R.J.	
27. KIND OF AWARD:		28. CUM. AMT.:		29. TELEPHONE: (301) 663-7277; AUTOVON 343-7277		SOCIAL SECURITY ACCOUNT NUMBER:
30. RESPONSIBLE DOD ORGANIZATION		31. RESPONSIBLE INDIVIDUAL		32. ASSOCIATE INVESTIGATORS		NAME: Crampton, K.T.
NAME: US Army Medical Bioengineering ADDRESS: Research & Development Laboratory Fort Detrick, Frederick, MD 21701		NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		NAME: POC:DA		NAME:
33. KEYWORD (Provide back with Security Classification Code) (U) Environmental Container; (U) Field Container; (U) Arctic Field Container; (U) Medical Supply Container; (U) Arctic Supplies; (U) Arctic Protection						
34. TECHNICAL OBJECTIVE, 25. APPROACH, 26. PROGRESS (Punish individual paragraphs identified by number. Provide last of each with Security Classification Code.)						
23. (U) To develop a container to protect freezable military medical items in an Arctic environment.						
24. (U) Design, fabricate and evaluate a container to meet the requirements of Arctic use.						
25. (U) 7710 - 7809. Developmental and operational testing of the prototype containers has been accomplished. Additional developmental testing on the performance of the container with a payload and without power has been completed. Results of testing indicate that in order to meet the principal characteristics of the letter requirement, additional insulation will be required.						

DETAIL SHEET

TITLE: Environmental Protection Containers for Medical Supplies

WORK UNIT NO: 015

AGENCY ACCESSION NO: DA OA 6290

PRINCIPAL INVESTIGATOR: O'Connor, R. J.

BACKGROUND

A need exists for an insulated, heated container for the protection of medical supplies, which can be damaged by freezing, for use in an arctic environment.

A letter requirement (LR) for an environmental protection container (EPC) for the protection of medical supplies was drafted and approved.

After engineering tests and limited operational testing of a breadboard prototype container, four advanced development prototypes were fabricated and subjected to developmental (DT II) and operational (OT II) testing during the 2nd and 3rd Qtr FY 77. Unseasonably warm weather in Alaska provided unsatisfactory test conditions. As a result the prototypes were scheduled for additional operational testing during 2nd Qtr FY 78.

PROGRESS

Operational testing of the EPC was accomplished at Exercise Empire Glacier at Fort Drum, NY in January and February 1978. The test report was reviewed and supplemental developmental testing was undertaken to measure the response of the container to conditions which could not be met at the field exercise. One of the principal characteristics which the EPC must meet and which has presented the greatest difficulty in assessing is the requirement that the container be able to keep the payload from freezing for a period of 8 hours after the power is disconnected, at an outside temperature of -50°F. A payload of approximately 120 lbs. (mostly freezable) was prepared and loaded into the container and the container and payload was placed in a large environmental chamber which could produce the low temperatures required for the test.

Results of the testing show that the payload stays above freezing for at least six hours and parts of the payload will stay above freezing much longer.

New prototypes based on additional calculations, which account for edge and corner effects, will be fabricated. The new prototypes will also have an additional inch of insulation in all walls. The weight constraints of the letter requirement will be met without difficulty.

REFERENCES

1. Letter, ARAMD, subject: Environmental Protection Container, dated 28 March 1974.
2. Letter, SGRD-SDM, subject: Environmental Protection Container for Medical Supplies, dated 23 August 1974.
3. Test Report, USAMBRDL, MR 32-75, subject: Environmental Protection Container, dated 7 October 1975.
4. Letter Report, Company C, 172nd Support Battalion, subject: Container Test, dated 9 March 1976.
5. Report, USAMMA, subject: Report of Operational Test II, dated 10 May 1977.
6. Test Report, USAMBRDL, MR-17-77, subject: Developmental Test (DT II) of Environmental Container, dated 13 December 1977.
7. Test Report, Medical Equipment Test and Evaluation Division, USAMMA, Fort Sam Houston, TX., subject: Report of Operational Test III (OT III) Environmental Protection Container (EPC) for Medical Supplies, dated 14 April 1978.
8. Letter, SGRD-UBE-G, subject: Environmental Protection Container for Medical Supplies Operational Test III (OT III) and inclosure.
9. Test Report, USAMBRDL, MR-19-78, subject: Supplemental Developmental Testing: Environmental Protection Container for Medical Supplies, dated 29 Sept 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL	
77 10 01	D. CHANGE	U	U	DA OB 6183	78 10 01	DD-DR&E(AR)636	
10. NO./CODES ^c		PROGRAM ELEMENT	PROJECT NUMBER	7. REGRADING ^d	8. DISSEM INSTRN ^e	9. SPECIFIC DATA-CONTRACTOR ACCESS	
A. PRIMARY	64717A	35164717D832	00	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
X XXXXXXXXXX	62778A	35162778A838	00				
X XXXXXXXXXX	CARDS 114f						
11. TITLE (Pencils with Security Classification Codes)				12. SCIENTIFIC AND TECHNOLOGICAL AREA ^f			
(U) Cabinets, MUST, Redesign of				009800 Medical and Hospital Equipment; 004400 Containers and Packaging			
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY	16. PERFORMANCE METHOD		
7608		7905		DA	C. In-House		
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS		
				FISCAL YEAR	PREVIOUS 78	0.7	140
				CURRENT	79	1.7	65
20. RESPONSIBLE DOD ORGANIZATION				21. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (Punish Sean II U.S. Academic Institutions) NAME: Patzer, N.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:			
22. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
23. KEYWORD (Pencils with Security Classification Codes) (U) Cabinets; (U) Tables; (U) MUST; (U) Field Containers; (U) Combat Support Hospital							
24. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Puncish individual paragraphs identified by number. Pencils test of each with Security Classification Codes)							
23. (U) To redesign and develop new cabinets for the MUST Combat Support Hospital to reduce: weight, procurement costs, and number of different sizes.							
24. (U) Design and fabricate new cabinets and evaluate for acceptance.							
25. (U) 7710 - 7809. Technical data package for 18"x36" and 18"x24" upper and lower cabinets and 34"x36" table has been completed. The 18"x36" X-ray cassette cabinet and 17"x41" table were evaluated and final drawings initiated. The technical data package for both items will be completed in 1st Quarter FY79. The 9"x18" pharmacy cabinets have been evaluated and modifications are required to incorporate recommended changes. Retest and preparation of technical data package on the pharmacy cabinets are scheduled to be completed in 3rd Quarter FY79.							

^aAvailable to contractors upon originator's approval.

DD FORM 1 MAR 68 1498

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65 AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

DETAIL SHEET

TITLE: Cabinets, MUST, Redesign of

WORK UNIT NO: 016

AGENCY ACCESSION NO: DA OB 6183

PRINCIPLE INVESTIGATOR: Patzer, N. H.

BACKGROUND

Due to high procurement cost for current MUST cabinets, a work unit was initiated 26 July 1976 to reduce cost by redesign. The cabinets were to be redesigned to reduce procurement cost by changing materials and by developing a design that will promote more competition in bidding. Life cycle costs were to be reduced by designing cabinets to be multi-purpose and thereby reduce the number of catalogue and inventory items.

PROGRESS

During FY 77 and 78 prototype cabinets were redesigned and fabricated as follows: Surgical Instrument and Dressing Upper and Lower Units 18" x 24" x 36" and 18" x 36" x 36"; Pharmacy and Narcotics Units 9 x 18 x 36; X-Ray Cassette Unit 18 x 36 x 36; and Folding Tables 34" x 36" and 17" x 41", 7 cabinets and 2 tables total. Cabinets and tables have been evaluated and found to meet requirements as replacements for current MUST cabinets.

The technical data package; drawings, bill of materials, and specifications; for the 18 x 24 & 18 x 36 cabinets and 34 x 36 table are ready for type classification. DPSC has established national stock numbers for the cabinets and table.

Drawings for the X-ray cassette cabinet and 17" x 41" table are 25% complete. Technical data packages for the 9" x 18" Pharmacy and Narcotics Cabinets will be completed in FY 79.

REFERENCES

1. Letter, SGRD-SDM, 26 July 1976, subject: MUST Cabinets.
2. D/F, MET&E Division, USAMMA, FSHT, 16 May 1977, subject: Chest Set MUST Prototype (18 x 36 x 36 Upper and Lower Units).
3. D/F, SGMMA-MD-P, 9 August 1977, subject: Evaluation of 6530-00-NS MUST Cabinets, Upper and Lower Units (18 x 24 x 36 Upper and Lower Units).

4. D/F, SGMMMA-MD-P, 30 Sept 1977, Subject: 6530-NS MUST Cabinet, Upper 18,36, Lower 18 x 36.
5. D/F, SGMMMA-MD-P, 5 April 1977, Subject: Evaluation of Pharmacy Cabinet, NSN 6530-00-421-4769 (9 x 18 x 36 Pharmacy and Narcotics Units).
6. Letter, SGRD-OPM, 20 April 1978, Subject: Joint Working Group Held at USAMBRDL, 22 March 1978.
7. D/F, SGMMMA-MD-P, 25 May 1978, Subject: Evaluation of Redesigned MUST Peculiar Items (X-Ray Cassette Cabinet, 17 x 41 Surgical Sink Table).
8. Plan of Evaluation (MET&E Project No. 3-78) User Test: Modified Pharmacy Cabinets (MET&E Project No. 3-78).

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL DD-DR&E(AR)636	
1. DATE PREV SUMMARY 77 10 01	2. KIND OF SUMMARY D. CHANGE	3. SUMMARY SCRTY ⁴ U	4. WORK SECURITY ⁵ U	5. REGRADING ⁶ NA	6. DISC'DN INSTN'N NL	7. SPECIFIC DATA-CONTRACTOR ACCESS <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	8. LEVEL OF SUM A. WORK UNIT
10. NO./CODES ⁷ a. PRIMARY b. CONTRIBUTING XXXXXX	PROGRAM ELEMENT 64717A 62778A CARDS 1423R	PROJECT NUMBER 3S164717D832 3S162778A838		TASK AREA NUMBER 00 00	WORK UNIT NUMBER 017 APC F567 015		
11. TITLE (Provide with Security Classification Code) (U) Chair, Dental Operating, Portable							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 008800 Life Support; 009800 Medical and Hospital Equipment							
13. START DATE 7610	14. ESTIMATED COMPLETION DATE 8004		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE PREVIOUS FISCAL YEAR 78 79	19. PROFESSIONAL MAN YRS CURRENT 0.2 1.0	20. FUNDS (\$ in thousands) 68 45	
a. DATES/EFFECTIVE: b. NUMBER: c. TYPE: d. KIND OF AWARD:	EXPIRATION: e. AMOUNT: f. CUM. AMT.		21. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
22. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				23. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
24. GENERAL USE Foreign Intelligence Not Applicable				PRINCIPAL INVESTIGATOR (Provide name if U.S. Army contractor investigator) NAME: Malek, J.W. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME: POC:DA			
25. KEYWORD (Provide each with Security Classification Code) (U) Dental Chair; (U) Dental Operating; (U) Portable Chair; (U) Field Dental Chair							
26. TECHNICAL OBJECTIVE, 27. APPROACH, 28. PROGRESS (Provide individual paragraphs identified by number. Precede text of each with Security Classification Code)							
23. (U) To design and fabricate a new portable dental operating chair for Army field use, incorporating light weight materials.							
24. (U) Design, fabricate and evaluate a suitable chair.							
25. (U) 7710 - 7809. Two prototype chairs and stools as well as shipping containers have been designed and fabricated. Development testing of the prototype have been initiated.							

DETAIL SHEET

TITLE: Chair, Dental Operating, Portable

WORK UNIT NO: 017

AGENCY ACCESSION NO: DA OB 6184

PRINCIPAL INVESTIGATOR: Malek, J. W.

BACKGROUND

This task was established 1 October 1977. It's purpose was to produce prototypes of a new portable dental operating chair for Army field use incorporating weight and cube reductions. Designs were initiated and fabrication commenced using lighter materials expected to yield weight reduction without sacrifice in utility.

PROGRESS

During the year, redesign resulting in weight reduction and possible mass production was completed. Also during the year, response to the proposed Letter Requirement (LR) were accomplished. Two prototypes were fabricated and subjected to DT I evaluation. Task was moved from 6.2 to 6.4 Development Program.

REFERENCES

1. Letter, SGRD-SDD, dated 1 Sep 1976, subject: Establishment of Task; Chair, Dental Operating Portable.
2. Letter, SGRD-UBE-G, dated 15 Oct 1976, subject: Chair, Dental Operating, Portable.
3. Letter, SGRD-OP, dated 15 Sept 1978, Subject: Engineering Development of the U.S. Army Chair and Stool Unit, Dental Operating, Field Task No. A838.00.015

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ³	6. WORK SECURITY ³	DA OB 6062	78 10 01	DD-R&E(AR)636
77 10 01	D. CHANGE	U	U	NA	NL	8. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
9. NO. (CODES) ⁴	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	9. LEVEL OF SUM A. WORK UNIT	
A. PRIMARY	64717A	3S1647170832		00	018 APC F555	
B. CONTRIBUTING	CARDS 1664					
11. TITLE (Provide with Security Classification Code) (U) Military Dog Shipping Multipurpose Container						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7505	7906	DA		C. In-House		
17. CONTRACT/GRANT						
18. DATES/EFFECTIVE: EXPIRATION:						
19. NUMBER:						
20. TYPE:						
21. KIND OF AWARD:						
22. RESPONSIBLE DOO ORGANIZATION						
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701						
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434						
23. GENERAL USE Foreign Intelligence Not Applicable						
24. KEYWORD (Provide EACH with Security Classification Code) (U) Veterinary; (U) Dogs; (U) Shipping Container; (U) Transportation; (U) Rabies; (U) Cage						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Provide individual paragraphs identified by number. Provide text of both with Security Classification Code.)						
23. (U) To develop a lightweight, portable, rugged, collapsible, lock-in-place, nesting, easily sanitized and maintainable, multipurpose container. The item will serve for shipping military dogs worldwide; temporary housing; secure confinement for quarantining rabies suspect animals and a cage for other animals of military dog size.						
24. (U) Design, fabricate, test, and evaluate items to meet the military requirements for a suitable container.						
25. (U) 7710 - 7809. Containers approved for type classification effort at IPR. Technical data package being prepared.						
28. Availability to contractors upon contract's approval.						

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DD FORM 1 MAR 68 1498

PREVIOUS EDITIONS OF THIS FORM ARE OBSOLETE. DD FORMS 1498A, 1 NOV 65
AND 1498-1, 1 MAR 68 (FOR ARMY USE) ARE OBSOLETE.

* U.S. GPO: 1974-540-843/8691

DETAIL SHEET

TITLE: Military Dog Shipping Multipurpose Container

WORK UNIT NO: 018

AGENCY ACCESSION NO: DA OB 6062

PRINCIPAL INVESTIGATOR: Cranford, H. B.

BACKGROUND

The purpose of the task is to develop a Multipurpose Shipping Container for use in shipping military dogs worldwide, as temporary housing, as secure confinement for quarantining rabies suspect animals, and as a cage to house other animals of military dog size. The container is to be lightweight, portable, rugged, collapsible, nested, easily sanitized, and maintainable. Task was established on 5 May 75 (references 1 and 2).

Prototype container developed under task A816.14.019 and Operational Test (OT I) results, were evaluated resulting in three problems requiring resolution: (1) patent infringement; (2) 2" dimension variation; and (3) weight reduction.

1. The question of patent infringement arose when the prototype containers built by Church Metal Spinning Company, which are covered by two patents, did not perform as desired. Consequently MERDL built its own prototype container under A816.14.019, during 1970-1971. Since the MERDL container is very similar to the Church Metal Container, the Judge Advocate Office was asked for a decision on possible patent infringement. The problem was addressed in reference 3, in which the conclusion stated "....., there would seem to be no reason why USAMBRDL should delay in its decision to proceed with the IPR as planned." In addition, the letter presented several methods on how the problems could be resolved through various legal channels. The IPR (reference 4) decided to continue with the development of the containers.

2. During the OT I, it was recommended that containers be reduced in length by two (2) inches to allow denser packing on Air Force standard pallets. A review of the subject on 19 December 1975, did not support the recommendations, therefore, the containers retained their original dimensions.

3. The MERDL container could not meet the weight requirement of the ROC (reference 2). A weight reduction analysis was performed and presented at the 22 July 1975 DRB (reference 6). The changes were approved which

reduced the weight of the container to 120 pounds which is below the 12 pounds maximum allowed in the ROC. Additional changes were made to improve the reliability and maintainability.

The Informal IPR (reference 4) was convened on 10-12 June 1976 to review the status of the task. It directed USAMBRDL to fabricate four canine multipurpose shipping containers incorporating weight reduction changes. The Development Plan (reference 7) with modifications was approved. The IPR also requested a dog shipping container be loaded on a DC-9 aircraft, since this aircraft is used to transport dogs within CONUS. The loading test (reference 5) concluded the MERDL dog shipping container cannot be loaded into the storage compartment of the DC-9 aircraft since the assembled container will not fit thru the baggage door. The R&D Command concluded (reference 5) that since the cross country and overseas flights are made in C-141 type aircraft, which can accommodate the MERDL container, the container would not be changed.

On 15 January 1976 (reference 8) the Veterinary Consultant, Colonel Ramsey viewed the new prototype and approved the weight reduction changes of the DRB (reference 6). Additional changes were recommended which Colonel Ramsey wanted to view prior to the fabrication of the prototypes for DT II and OT II tests.

One USAMBRDL prototype container was fabricated for the 22 March 1976 IPR (reference 9). The additional changes were viewed and approved by Colonel Ramsey during the IPR, at which time the IPR authorized the construction of four (4) additional container for DT II and OT II. The four (4) USAMBRDL containers were fabricated by the end of May 1976.

The Development Test Plan (DT II) (reference 10) was approved on 6 May 1976 (reference 11) and testing started the end of May 1976. The Technical Manual (reference 12) was finished the end of May 1976.

Four container were shipped to Aberdeen Proving Grounds to transport pups to Kelly Air Force Base as part of the OT II test by Medical Equipment Test and Evaluation Division, USAMMA, Fort Sam Houston, Texas (reference 13). A Letter Report (reference 14) of the operation was forwarded to USAMBRDL. The four containers were returned to this Laboratory on 6 August 1976 to allow completion of DT II. The containers were slightly damaged and were repaired and refurnished by the Laboratory.

PROGRESS

The containers successfully passed DT II (reference 15) the maintenance evaluation (reference 16), and OT II (reference 17). Several changes were authorized to the design (reference 18) that eliminated minor problems which occurred during OT II. The March IPR (reference 19) recommended type classification of the container. Drawings and specifications are being prepared for transmittal so that type classification and procurement may be effected.

REFERENCES

1. Letter, Academy of Health Sciences, United States Army, Fort Sam Houston, Texas, HSA-CDM, 16 March 1975, subject: Required Operational Capability (ROC) for a Military Dog Shipping Multipurpose Container.
2. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 18 April 1975, subject: Required Operational Capability (ROC) for a Military Dog Shipping Multipurpose Container.
3. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SSJ, 29 May 1975, subject: Military Dog Shipping Multipurpose Container.
4. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 2 July 1975, subject: Minutes and Recommendations Informal In-Process Review (IPR), 10-12 June 1975.
5. Letter, Department of the Army Office of the Surgeon General, Washington, D.C., SGRD-SDM, 14 July 1975, subject: Loading Test of the Military Dog Shipping Multipurpose Container Aboard a DC-9 Aircraft.
6. Meeting, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE, 22 July 1975, subject: Engineering Division Development Review Board (DRB) Meeting.
7. Development Plan, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 7 August 1975, subject: Development Plan for Military Dog Shipping Multipurpose Container.
8. Memorandum for Record, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, SGRD-UBE-G, 19 January 1976, subject: Military Dog Shipping Multipurpose Container.
9. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-SDM, 7 April 1976, subject: Minutes of Formal Special In-Progess Review (IPR), 22 March 1976.
10. Cranford, H. B., Jr., "Development Test Plan (DT II) Canine Multipurpose Shipping Container, Task No. D832.00.018, March 1976", U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland.
11. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., 6 May 1976, subject: Canine Multipurpose Shipping Container, Task No. D832.00.018, SGRD-SDM (23 March 76) 1st Ind.
12. Manual: "Operators, Organizational and Direct Support Manual for Canine Multipurpose Shipping Container", U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, May 1976.

13. Shipment Request, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick, Maryland, USAMBRDL Form 113, 27 May 1976.
14. Letter, Medical Equipment Test and Evaluation Division, U.S. Army Medical Material Agency, Fort Sam Houston, Texas, SGMMA-TD, 14 June 1976, subject: Canine Multipurpose Shipping Container.
15. Hodge, J. S., et al., "Developmental Test (DT II) of Canine Multi-purpose Shipping Container, Task No. D832.00.018", 27 October 1976, U.S. Army Medical Bioengineering Research and Development Laboratory, Fort Detrick, Frederick Maryland 21701
16. Letter, DA, Army Medical Materiel Agency, Frederick Maryland, SGMMA-MP, 26 January 1977, subject: Maintenance Evaluation of Optometry Set, Field, Combat and Container, Shipping Multipurpose Canine.
17. Flammia, H. S., "Report of Operational Test II (OT II) Container, Shipping, Multipurpose, Canine (MET&E Project No. 10-76), 5 May 1977, Department of the Army, Army Medical Materiel Agency, Medical Equipment Test and Evaluation Division, Fort Sam Houston, Texas 78234.
18. Letter, U.S. Army Medical Research and Development Command, Washington, D.C., SGRD-OPM, 29 July 1977, subject: Report of Operational Test II (OT II) Container, Shipping, Multipurpose, Canine.
19. LTR, SGRD-OPM, 30 Mar 1978, subject: Minutes of Formal Special In-Process Review (IPR), 21 March 1978.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL		
3. DATE PREV SUMMARY		4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	7. REGRADING*	8A. DISP'N INSTRN	8B. SPECIFIC DATA CONTRACTOR ACCESS	9. LEVEL OF SUM
77 10 01		D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	A. WORK UNIT
10. NO. CODES*		PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY		64717A	3S164717D832		00	019 APC F553		
B. CONTRIBUTING		XXXXXXX (03)						
11. TITLE (Provide with Security Classification Code)* (U) Accessory Kit MUST Service Ward Container								
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 008800 Life Support								
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7506		7904		DA		C. In-House		
17. CONTRACT/GANT				18. RESOURCES ESTIMATE				
B. DATES/EFFECTIVE:				EXPIRATION:		FISCAL YEAR		C. PROFESSIONAL MAN YRS
						PRECEDING		1.0
C. NUMBER:				FISCAL YEAR		CURRENT		52
D. TYPE:				E. AMOUNT:		79		0.3
E. KIND OF AWARD:				F. CUM. AMT.				12
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION				
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNMAI BEAN IF U.S. Academic Institution) NAME: Patzer, N.H. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Crampton, K.T. NAME:				
21. GENERAL USE Foreign Intelligence Not Applicable				POC:DA				
22. KEYWORD (Provide EACH with Security Classification Code)*								
(U) Accessory; (U) Utilities; (U) Ward Container; (U) MUST								
23. TECHNICAL OBJECTIVE* 24. APPROACH. 25. PROGRESS (Punish individual paragraphs identified by number. Provide rest of each with Security Classification Code)*								
23. (U) To develop an accessory kit for the MUST service ward container which will provide for control and distribution of the basic utilities; air, water, light and electrical power; when used as a general shelter.								
24. (U) Analysis of the functional requirements of the kit and the components needed will provide data to design, fabricate and evaluate the kits. A technical report will be prepared and transmitted to Type Classification Agency.								
25. (U) 7710 - 7809. Final prototype kits have been designed, fabricated and shipped for user evaluation in 1st Quarter FY79. A technical report including drawings and data will be transmitted to NARADCOM in 2nd Quarter FY78 for use in type classification.								

DETAIL SHEET

TITLE: Accessory Kit MUST Service Ward Container

WORK UNIT NO: 019

AGENCY ACCESSION NO: DA OB 6061

PRINCIPLE INVESTIGATOR: Patzer, N. H.

BACKGROUND

The first accessory kit for the Ward Service Container was developed as a component of the prototype Sanitation Complex in the late 1960's. On 16 April 1975, a task was initiated to develop the kit as a separate item.

The original kits were used and tested as part of the prototype MUST Sanitation Complex.

PROGRESS

Prototype kits of final design have been fabricated and shipped to the 10th Combat Support Hospital at Ft. Meade for evaluation 1st Qtr FY 79. With a positive evaluation a technical report, preliminary drawings, bills of material and data, will be prepared and transmitted to MARADCOM 2nd Qtr FY 79 for use in type classification.

REFERENCES

1. Letter establishing the work unit, SGRD-SDM, MUST Service Ward Container, 26 July 1976.
2. Technical Report No. 77 05, USAMBRDL, Accessory Kit Multi-Purpose Shelter MUST, Neil H. Patzer, April 1977.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY	6. WORK SECURITY	DA OB 6057	78 10 01	DD-DR&E(AR)636	
77 10 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER	WORK UNIT NUMBER		
A. PRIMARY	64717A	35164717D832		00	020 APC F571		
B. CONTRIBUTING	62778A	35162778A838		00	104		
KXXXXXXK CARDS 1403A							
11. TITLE (Provide with Security Classification Code)* (U) Light Trap, Portable, Mosquito							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS* 009800 Medical and Hospital Equipment; 002400 Bioengineering; 005900 Environmental Biology							
13. START DATE	14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7504	7909		DA		C. In-House		
17. CONTRACT/GRANT							
18. DATES/EFFECTIVE:		EXPIRATION:		19. RESOURCES ESTIMATE		20. PERFORMANCE METHOD	
B. NUMBER*				FISCAL YEAR	PREVIOUS	A. PROFESSIONAL MAN YRS	B. FUNDS (In thousands)
C. TYPE:		D. AMOUNT:			78	0.3	21
E. KIND OF AWARD:		F. CUM. AMT.:			79	1.2	40
21. RESPONSIBLE DOD ORGANIZATION							
NAME* US Army Medical Bioengineering Research & Development Laboratory				NAME* US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS* Fort Detrick, Frederick, MD 21701				ADDRESS* Fort Detrick, Frederick, MD 21701			
PRINCIPAL INVESTIGATOR (PUNISH SEPARATELY U.S. Academic Institutions)							
NAME* Kardatzke, J.T.				NAME* O'Connor, R.J.			
TELEPHONE (301) 663-7237; AUTOVON 343-7237				NAME* Schiefer, B.A. POC:DA			
SOCIAL SECURITY ACCOUNT NUMBER:							
ASSOCIATE INVESTIGATORS							
22. KEYWORD (Provide Space with Security Classification Code) (U) Mosquito Light Trap; (U) Disease Vectors; (U) Pest Mosquitoes; (U) Mosquito Surveys; (U) Population Studies							
23. TECHNICAL OBJECTIVE.* 24. APPROACH. 25. PROGRESS (Provide individual paragraphs identified by number. Provide rest of each with Security Classification Code.)							
23. (U) To develop a portable battery-operated mosquito light trap for use in disease vector and pest mosquito surveys. This will replace the standard light trap set (NSN: 6545-00-089-3766) which has proven unsatisfactory for field use.							
24. (U) Design and fabricate a suitable portable mosquito light trap and conduct field evaluation in various habitats.							
25. (U) 7710 - 7809. The new miniature light trap system has proven superior in developmental testing conducted in CONUS and Panama. An LR, a development plan, and a coordinated test plan are being prepared. Operational tests will be conducted in May 1979.							

DETAIL SHEET

TITLE: Light Trap, Portable, Mosquito

WORK UNIT NO: 020

AGENCY ACCESSION NO: DA OB 6057

PRINCIPAL INVESTIGATOR: Kardatzke, J.T.

BACKGROUND

A work unit was established by the U.S. Army Medical Research & Development Command (SGRD-SDM, 31 Mar 75) to develop a durable, light-weight portable mosquito light trap to replace the Army standard light trap set (NSN 6545-00-089-3766) which has proven unsatisfactory for field use.

The new miniature light trap system has proven superior to the previous system during developmental testing in CONUS and Panama. The system is highly flexible and should rapidly be adopted by both the military/government and private users. The basic trap design has been finalized. Only results from operational testing could produce an alternative.

PROGRESS

The coordinated test program, the test support package, the development plan, and Letter Requirement have been prepared and are currently in various phases of staffing. In addition, the concept formulation package has been initiated by the Combat Developer at AHS.

Operational testing has been scheduled for May 1979 at Fort Bragg, NC. The test will involve two sets of six traps each. The entire variety of acceptable power sources, both DC and AC, will be included for evaluation.

This task has been recommended for placement in advanced development (832, 6.4).

TITLE: Light Trap, Portable, Mosquito (Cont'd)

REFERENCES

1. Letter, SGRD-SDM, to USAMBRDL, dated 31 March 1975, subject: Proposed Entomological Tasks.
2. Report, MEDEC-ZFB to HQDA (DASG-HEP-D), dated 27 October 1971, subject: VEE Surveillance Team Final Report.
3. Minutes, DRB Meeting No. 76-7, SGRD-UBE, dated 29 January 1976, subject: Materiel Development Review Board.
4. Letter, ALBO-E to USAMBRDL, dated 11 July 1973, subject: Improvement of Mosquito Light Trap Set.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL			
3. DATE PREV. SUMRY	4. KIND OF SUMMARY	5. SUMMARY SCRTY*	6. WORK SECURITY*	DA OB 6052	78 10 01	DD-DR&E(AR)636			
78 05 01	H. TERMINATION	U	U	NA	NL	7. REGRADENO ⁸	8A. DISR'DN INSTRN ⁹	8B. SPECIFIC DATA-CONTRACTOR ACCESS	8C. LEVEL OF SUM
				NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	A. WORK UNIT	
10. NO./CODES,* PROGRAM ELEMENT				PROJECT NUMBER		TASK AREA NUMBER		WORK UNIT NUMBER	
A. PRIMARY	64717A	35164717D832		00		020 APC F554		B. CONTRACTING	
B. CONTRACTING									
KXXXXXXM CARD 14390 (3)									
11. TITLE (Provide with Security Classification Code)*									
(U) Food Service Army TOE Hospital (Combat Support-Evacuation)									
12. SCIENTIFIC AND TECHNOLOGICAL AREA(S)									
009800 Medical and Hospital Equipment; 006500 Food									
13. START DATE	14. ESTIMATED COMPLETION DATE			15. FUNDING AGENCY	16. PERFORMANCE METHOD				
7505	CONT			DA	C. In-House				
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE					
				PROFESSIONAL		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)	
				FISCAL	78	0.0	00		
				YEAR	79	0.0	00		
21. RESPONSIBLE DOD ORGANIZATION				22. PERFORMING ORGANIZATION					
NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNISH SEPARATE IF U.S. GOVERNMENT INVESTIGATOR) NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME: POC: DA					
23. KEYWORD (Provide each with Security Classification Code)									
(U) Food Service; (U) Evacuation Hospital; (U) Combat Support Hospital; (U) MUST									
24. TECHNICAL OBJECTIVE,* 25. APPROACH, 26. PROGRESS (Punish individual paragraphs identified by number. Provide each with Security Classification Code)									
23. (U) To evaluate and fabricate an efficient patient food service subsystem for Medical Unit Self-Contained Transportable (MUST) system.									
24. (U) The food service prototype equipment will be evaluated relative to revised QMR for MUST. This action will require weight reduction considerations and value engineering of the food service components.									
25. (U) 7710 - 7804. No progress. This work unit terminated per In-Process Review held at USAMBRDL 21-23 March 1978.									
*Available to contractors upon contractor's request.									

DETAIL SHEET

TITLE: Food Service Army TOE Hospital (Combat Support-Evacuation)

WORK UNIT NO: 020

AGENCY ACCESSION NO: DA OB 6052

PRINCIPAL INVESTIGATOR: Salisbury, L. L.

BACKGROUND

The MUST Food Service Complex was referred to USAMBRDL by the R&D Command, 1 July 1975, for Value Engineering Study. The principle objective was to reduce the weight of the complex without degrading its capabilities. The total complex including containers weighs over 33,000 pounds with 80% of this weight not food service related.

A report was submitted in October 1975, in which three options were identified. Option One proposed eliminating non-essential equipment and the substitution of smaller, lighter equipment for some other items. This option resulted in a 6% savings of weight.

Option Two included all items of option one plus the redesign of a number of pieces of equipment for multi-use and or weight reduction. This would have resulted in a total savings of 7.5% of the weight.

Option Three proposed a re-evaluation of the food service requirements in anticipation of food technology developments by 1985.

Acting on the report, the Surgeon General has requested NARADCOM to initiate a program for the development of a new MUST food service (Option Three).

An inventory of food service related items, of shelter related items, and hospital related items, has been prepared and submitted through channels.

A number of food service items have been sent to NARADCOM (references 4f and 4g). Awaiting instruction from USAMMA (SGMMA-II01) for return of shelters (reference 4h).

PROGRESS

None. With submission of report and return of equipment, work unit was

terminated per In-Process Review held at USAMBRDL in March 78.

REFERENCES

1. Engineering Test of Food Service Sub-system of Medical Units, Self-Container, Transportable, U.S. Army General Equipment Test Activity, Fort Lee, Virginia, June 1971.
2. Report of Expanded Service Test, Medical Equipment Test and Evaluation Division, U.S. Army Medical Field Service School, Fort Sam Houston, Texas, 4 May 1972.
3. Report of Check Test, Medical Equipment Test and Evaluation Division, U.S. Army Medical Materiel Agency, Fort Sam Houston, Texas, 18 October 1974.
4. Letter, SGRD-SDM, dated 20 March 1975.
5. Food Service, Army TOE Hospital, Preliminary Value Engineering Study, U.S. Army Medical Bioengineering R&D Laboratory, TR 71 51, October 1975.
6. Letter, SGRD-SDM, dated 22 October 1976.
7. Letter, SGRD-SDM, dated 15 November 1976.
8. Letter, SGRD-OPM, dated 15 July 1977.
9. Letter, SGRD-UBE, dated 22 May 78, Subject: Termination of Work Units.

IN-HOUSE LABORATORY INDEPENDENT RESEARCH

3A161101A91C

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6225	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SECY# U	6. WORK SECURITY# U	7. REGRADING# NA	8. DOD/NINSTN# NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES# A. PRIMARY 61101A	PROGRAM ELEMENT 3A161101A91C	PROJECT NUMBER 00		TASK AREA NUMBER 010	WORK UNIT NUMBER APC F157	11. LEVEL OF SUM A. WORK UNIT
12. TITLE (Printed with Security Classification Code) (U) Electronic Wet Bulb Globe Temperature Instrument						
13. SCIENTIFIC AND TECHNOLOGICAL AREA# 002400 Bioengineering; 009800 Medical and Hospital Equipment						
14. START DATE 7710	15. ESTIMATED COMPLETION DATE 7909	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GANT		19. RESOURCES ESTIMATE			20. PROFESSIONAL MAN YRS 0.1	
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	78	21. FUNDS (In thousands) 01		
B. NUMBER#	C. TYPE:	CURRENT	79	22. PERFORMING ORGANIZATION		
D. KIND OF AWARD:	E. AMOUNT: F. CUM. AMT.:	NAME# US Army Medical Bioengineering Research & Development Laboratory				
23. RESPONSIBLE DOD ORGANIZATION		ADDRESS# Fort Detrick, Frederick, MD 21701			24. PRINCIPAL INVESTIGATOR (Printed with Security Classification Code) NAME# O'Connor, R.J.	
NAME# Dettor, C.M., COL TELEPHONE# (301) 663-2434; AUTOVON 343-2434					TELEPHONE# (301) 663-7277; AUTOVON 343-7277	
25. GENERAL USE Foreign Intelligence Not Applicable		SOCIAL SECURITY ACCOUNT NUMBER:			ASSOCIATE INVESTIGATORS NAME# Stup, J.L. NAME# Crampton, K.T.	
					POC:DA	
26. KEYWORD (Printed with Security Classification Code) (U) Fatigue; (U) Comfort; (U) Humidity; (U) Heat Exhaustion						
27. TECHNICAL OBJECTIVE# 28. APPROACH, 29. PROGRESS (Printed individual paragraphs identified by number. Precede each with Security Classification Code.)						
23. (U) Design, fabricate and evaluate an electronic instrument; independent of external power sources and which will measure the three temperatures used to compute the Wet Bulb Globe Temperature (WBGT) index and in addition display the index.						
24. (U) Investigate electronic methods to produce accurate analogs of the temperatures used to compute the WBGT index.						
25. (U) 7710 - 7809. The thermistor approach was terminated upon location of an integrated circuit (IC) linear temperature measuring transducer which permitted development of simple circuits for determining the WBGT index. A breadboard circuit produces an alarm as a preset voltage corresponding to a particular WBGT index. Due to delay in receiving transducers, there was slippage in completing the design. There are many display possibilities that require investigation. There remains to chose the most economical, rugged method and to modify transducers to read black globe and wet bulb readings.						

DETAIL SHEET

TITLE: Electronic Wet Bulb Globe Temperature Instrument

WORK UNIT NO: 010

AGENCY ACCESSION NO: DA OB 6225

PRINCIPAL INVESTIGATOR: O 'Connor, R. J.

BACKGROUND

Hot weather risks to troops undergoing training are conventionally assessed by the measurement of the Wet Bulb-Globe Temperature Index (WBGT Index). This is done using the standard WBGT Kit (NSN 6665-00-159-2218) consisting of a wet bulb, dry bulb, and black globe thermometer and slide rule, which automatically displays the WBGT Index based on the temperatures read on the thermometer.

Current models of the WBGT Kit use glass thermometers which are subject to breakage and in addition have become increasingly expensive to manufacture.

Because of advances in electronic technology in recent years, it should be possible to produce an instrument which will measure the WBGT index using thermistors, integrated circuit operational amplifier chips, and either an analog or digital display of the index with a direct readout of the temperatures or index. The electronic unit would be battery powered and be lower in weight and volume than the current unit.

PROGRESS

Literature on the determination of the WBGT index by electronic means was reviewed. Some expensive commercial instruments which measure and display the index employing thermistors and digital circuitry were investigated. An integrated circuit (IC) linear absolute temperature measuring transducer has been identified. This IC has permitted the development of much simpler circuits than when employing thermistors. A breadboard circuit of this type was fabricated and tested. This particular circuit sounds an alarm at a preset voltage level which is analogous to a particular WBGT index. It can also be used to produce an output which continuously displays this voltage (or, if calibrated, this WBGT index). Many other types of displays are possible, including a relatively inexpensive null type employing light emitting diodes. There remains the refinement of the display, the design of suitable printed circuit boards, a packaging arrangement, and a means of accurately simulating black globe temperatures and arriving at a wick arrangement to determine the wet bulb temperature.

TITLE: Electronic Wet Bulb Globe Temperature Instrument (Cont'd)

REFERENCES

a. D/F, SGRD-UBE-G, to Commander, USAMBRDL, dated 16 September 1977,
signed by R. J. O'Connor, subject: Development of an All Electronic Wet
Bulb Globe Temperature (WBGT) Instrument, (ILIR Proposal).

b. D/F, SGRD-UBE-G, to Commander, USAMBRDL, dated 27 September 1977,
signed by R. J. O'Connor, subject: Development of a All Electronic Wet
Bulb Globe Temperature (WBGT) Instrument.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ¹	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL ³	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ⁴	6. WORK SECURITY ⁵	DA OB 6226	78 10 01	DD-DR&E(AR)636	
78 02 01	D. CHANGE	U	U	NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
7. NO./CODES ⁶				PROGRAM ELEMENT	PROJECT NUMBER	8. LEVEL OF SUM	
8. PRIMARY				61101A	3A161101A91C	A. WORK UNIT	
9. CONTRIBUTING					00	9. WORK UNIT NUMBER	
10. CONTRIBUTING					011 APC F156		
11. TITLE (Prefixes with Security Classification Code) ⁷ (U) Testing On-Line Total Organic Carbon (TOC) Monitors Designed for Army Wastewater Reuse Treatment Facilities							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ⁸ 007800 Hygiene and Sanitation; 003400 Civil Engineering							
13. START DATE 7610		14. ESTIMATED COMPLETION DATE 7810		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS			20. FUNDS (\$ in thousands)
21. DATES/EFFECTIVE:		22. EXPIRATION:		FISCAL YEAR	78	0.1	02
23. NUMBER:		24. AMOUNT:		CURRENT	79	0.1	04
25. TYPE:		26. CUM. AMT.:		27. PERFORMING ORGANIZATION			
28. KIND OF AWARD:		29. NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
30. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		31. GENERAL USE Foreign Intelligence Not Applicable		32. PRINCIPAL INVESTIGATOR (Prefixes with Security Classification Code) NAME: Cowen, W.F. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Peterman, B.W. NAME: POC:DA			
33. KEYWORDS (Prefixes with Security Classification Code) (U) Electrochemical Organic Content Analyzer; (U) Total Organic Carbon; (U) On-Line Analyzers; (U) Water Reuse							
34. TECHNICAL OBJECTIVE ⁹ 35. APPROACH, 36. PROGRESS (Prefixes individual paragraphs identified by number. Prefixes rest of each with Security Classification Code.)							
23. (U) To prepare a protocol for evaluation of on-line TOC monitors and to use this protocol for testing candidate monitors.							
24. (U) Define the sensitivity of the monitor to compounds expected in Field Army wastewaters treated for reuse. Test the long-term stability of response and sensitivity of the monitor. Evaluate the reproducibility of response to dilute and concentrated wastewaters. Investigate response interactions between two compounds. Correlate the monitor response to total organic carbon over a range of wastewater treatment processes.							
25. (U) 7710 - 7809. A PR-1 (low-level TOC) sample input module for off-line TOC measurements has been set up and tested, as has a breadboard electrochemical organic content (EOC) on-line analyzer. Test compounds chosen for study are sodium myristate, Hyamine 3500, and N,N-diethyl-m-toluamide (DEET).							

DETAIL SHEET

TITLE: Testing On-Line Total Organic Carbon (TOC) Monitors Designed
for Army Wastewater Reuse Treatment Facilities

WORK UNIT NO: 011

AGENCY ACCESSION NO: DA OB 6226

PRINCIPAL INVESTIGATOR: Cowen, W.F.

BACKGROUND

The development of facilities for treating Army wastewaters for reuse will require that the treatment processes be monitored with respect to organic carbon compounds. An electrochemical organic content (EOC) analyzer has been developed (Contract No. DAMD 17-75-C-5070) for on-line use following ozonation unit processes, but the applicability of this monitor for shower and laundry wastewaters treated for reuse is unknown. This project is designed to evaluate the EOC for such waters.

PROGRESS

The breadboard EOC has been tested with Hyamine 3500, an alkyl dimethyl benzyl ammonium chloride germicide expected to be present in shower wastes. A response profile for Hyamine 3500 at several adsorption voltages showed maximum response at -0.6 volts. A calibration curve of EOC value versus log concentration showed linearity between 1 and 10 mg/l, with a detection level of about 0.5 mg/l of the Hyamine formulation. Similar tests are in progress with DEET insecticide.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b DA OB 6227	2. DATE OF SUMMARY ^b 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)626
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SECY ^b U	6. WORK SECURITY ^b U	7. REGRADING ^b NA	8. DISSEM INSTRNM NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES: ^a PROGRAM ELEMENT A. PRIMARY 61101A B. CONTRIBUTING C. CONTRIBUTING				PROJECT NUMBER 3A161101A91C	TASK AREA NUMBER 00	11. LEVEL OF SUM A. WORK UNIT 012 APC F154
12. TITLE (Proceeds with Security Classification Code) ^b (U) Development of Techniques for the Concentration and Detection of Enteric Viruses in Water and Wastewater						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS ^b 008700 Laboratories, Test Facilities and Test Equipment; 007800 Hygiene and Sanitation; 005900 Environmental Biology						
14. START DATE 7710	15. ESTIMATED COMPLETION DATE 7906	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRAANT		19. RESOURCES ESTIMATE				
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PRECEDING 78	C. PROFESSIONAL MAN YRS 1.7	B. FUNDS (in thousands) 43	
B. NUMBER: ^a		CURRENT	79	1.0	35	
C. TYPE:	E. AMOUNT:					
D. KIND OF AWARD:	F. CUM. AMT.:					
20. RESPONSIBLE DOD ORGANIZATION		21. PERFORMING ORGANIZATION				
NAME: ^a	US Army Medical Bioengineering Research & Development Laboratory	NAME: ^a	US Army Medical Bioengineering Research & Development Laboratory			
ADDRESS: ^a	Fort Detrick, Frederick, MD 21701	ADDRESS: ^a	Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR (PUNISH 23AN IF U.S. ACADEMIC INSTITUTION)				
NAME:	Dettor, C.M., COL	NAME:	Schaub, S.A.			
TELEPHONE:	(301) 663-2434; AUTOVON 343-2434	TELEPHONE:	(301) 663-2036; AUTOVON 343-2036			
22. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER				
Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS				
		NAME: Taylor, G.W.	POC:DA			
		NAME: Rose, W.E.				
23. KEYWORD (PUNISH EACH WITH Security Classification Code)						
(U) Virus; (U) Detection; (U) Water; (U) Wastewater						
24. TECHNICAL OBJECTIVE, ^b 25. APPROACH, 26. PROGRESS (PUNISH individual paragraphs identified by number. Proceeds rest of each with Security Classification Code.)						
23. (U) To evaluate commercial filtration techniques for compatibility with the bentonite virus adsorption methodology for rapid, easy concentration of viruses from water and wastewater. To evaluate various means of eluting viruses from the clay entrapped on the filters for subsequent virus assay or ultimate concentration techniques.						
24. (U) Filtration of bentonite adsorbed virus will be evaluated on "best" candidate cartridge filters in various environmental waters. Elution and reconcentration techniques will be optimized for maximum virus recovery and reduced toxicity from waterborne chemicals. The virus concentration technology will be published in technical journals and a tentative virus concentration manual will be prepared for distribution to USAEHA and other potential users.						
25. (U) 7710 - 7809. Eighteen commercially produced cartridge filters were tested for their capability to retain bentonite adsorbed virus while allowing filtration of 378 l of tapwater and efficient virus recovery upon elution. Three filters provided this capability. Virus reconcentration techniques were tested for beef extract and glycine-EDTA-serum eluents. Organic flocculation and thin channel techniques could effectively reduce the final test volume (for tissue culture assay) to 10 ml.						

DETAIL SHEET

TITLE: Development of Techniques for the Concentration and Detection of Enteric Viruses in Water and Wastewater

WORK UNIT NO: 012

AGENCY ACCESSION NO: DA OB 6227

PRINCIPAL INVESTIGATOR: Schaub, S.A.

BACKGROUND

Currently there is no single virus concentration methodology which can be effectively used for recovery of virus from finished waters and wastewaters (or waters high in suspended solids). Additionally most techniques do not recover virus adsorbed or embedded within waterborne particulate materials. The Bentonite adsorption-filtration technology being developed in this study is designed for collecting and processing a wide range of waters and is capable of examining virus associated with suspended materials. It is also compatible with a variety of eluents and may allow even further reconcentration or volume reduction.

PROGRESS

Concentration/reconcentration techniques have been tested with various enteric viruses using preliminary cartridge filtration followed by elution and reconcentration with organic flocculation and stirred cell ultrafiltration. Some of the enteric viruses were recovered similarly to that observed with poliovirus (>50% recovery). Some of the non-enteroviruses experiences lower recovery. Antifoam B added to beef extract eluent provides significant improvement in poliovirus recovery during the original concentration and in reconcentration procedures.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b DA OB 6222	2. DATE OF SUMMARY ^b 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUM'RY 77 10 01	4. KIND OF SUMMARY H. TERMINATION U	5. SUMMARY SCRTY ^b U	6. WORK SECURITY ^b U	7. REGRADING ^b NA	8. DISR'D INSTRN ^b NL	9. SPECIFIC DATA CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ^a a. PRIMARY 61101A	PROGRAM ELEMENT 3A161101A91C	PROJECT NUMBER	11. TASK AREA NUMBER 00	12. LEVEL OF SUM A. WORK UNIT 013 APC F155		
b. CONTRIBUTING	c. CONTRIBUTING					
13. TITLE (Printed with Security Classification Code) (U) Characterization of ULV Spray Particle Spectra						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 002600 Biology						
15. START DATE 7710	16. ESTIMATED COMPLETION DATE 7809	17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House			
19. CONTRACT/GANT		20. RESOURCES ESTIMATE		21. PROFESSIONAL MAN YRS		
a. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PREVIOUS ^b	CURRENT	D. FUNDS (In thousands)	
b. NUMBER ^b			78	0.2	01	
c. TYPE:	d. AMOUNT:		79	0.0	00	
e. KIND OF AWARD:	f. CUM. AMT.					
22. RESPONSIBLE DOD ORGANIZATION		23. PERFORMING ORGANIZATION				
NAME ^b US Army Medical Bioengineering Research & Development Laboratory	ADDRESS ^b Fort Detrick, Frederick, MD 21701	NAME ^b US Army Medical Bioengineering Research & Development Laboratory				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		ADDRESS ^b Fort Detrick, Frederick, MD 21701				
24. GENERAL USE Foreign Intelligence Not Applicable		PRINCIPAL INVESTIGATOR /PRINCIPAL INVESTIGATOR IF U.S. Academic Institution NAME: Schiefer, B.A. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY / ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Gula, P.R. NAME: Nelson, J.H.				
		POC:DA				
25. KEYWORD (Printed each with Security Classification Code) (U) Ultra Low Volume (ULV); (U) Pesticide Aerosol Measurement; (U) Particle Size; (U) Vector Control; (U) Pest Management						
26. TECHNICAL OBJECTIVE, 24 APPROACH, 25. PROGRESS (Printed individual paragraphs identified by number. Print in full of each with Security Classification Code)						
23. (U) To characterize size of aerosol particles produced from various chemical formulations and distribution patterns produced by various pesticide dispersal units used within Army vector control/pest management programs.						
24. (U) A commercially available device designed to measure particle size will be utilized. Initial comparisons will be made with various EPA ultra low volume (ULV) registered pesticides, refined mineral oil and other non-toxic chemicals to find a chemical which can be used in all machines to compare equipment characteristics. Pesticide aerosol clouds produced by commonly used pesticide dispersal units will be characterized by determining distance and height to which various size particles are carried. After optimum distance for collecting samples is determined by type of machine, all makes and models of sprayers used in Army pest management programs will be tested. Information obtained will be used in the design and modification of ULV equipment and serve as a basis for future work in ultra low volume applications.						
25. (U) 7710 - 7809. Task terminated due to nonavailability of a reliable instrument to measure particle size. Numerous problems were identified with an Optical Array Spectrometer PDS 300 System manufactured by Particle Measuring Systems, Inc. which have not been resolved. Additional work must be accomplished to identify a reliable particle measuring device or technique by other research tasks before the objectives of this study can be met.						

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ³	REPORT CONTROL SYMBOL		
3. DATE PREV SUMMARY		4. KIND OF SUMMARY	5. SUMMARY SCITY ⁴	6. WORK SECURITY ⁵	7. REGRADING ⁶	8. DOD/N INSTRN	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
NA		A. NEW	U	U	NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
10. NO./CODES ⁷		PROGRAM ELEMENT	PROJECT NUMBER		TASK AREA NUMBER		A. WORK UNIT	
a. PRIMARY		61101A	3A161101A91C		00		014 APC F158	
b. CONTRIBUTING								
c. CONTRIBUTING								
11. TITLE (Printed with Security Classification Code) (U) Foreign Body Locator, Ultrasonic, Non-Invasive								
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 002400 Bioengineering; 009800 Medical and Hospital Equipment								
13. START DATE		14. ESTIMATED COMPLETION DATE		15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7810		7912		DA		C. In-House		
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE				
a. DATES/EFFECTIVE:				b. PROFESSIONAL MAN YRS				
b. NUMBER:				c. FUNDS (In thousands)				
c. TYPE:				FISCAL	78	0.0	00	
d. KIND OF AWARD:				YEAR	CURRENT	79	0.3	12
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory				NAME: US Army Medical Bioengineering Research & Development Laboratory				
ADDRESS: Fort Detrick, Frederick, MD 21701				ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL				PRINCIPAL INVESTIGATOR (Print in all caps if U.S. Army/DoD personnel)				
NAME: Dettor, C.M., COL				NAME: Salisbury, L.L.				
TELEPHONE: (301) 663-2434; AUTOVON 343-2434				TELEPHONE: (301) 663-7277; AUTOVON 343-7277				
21. GENERAL USE				SOCIAL SECURITY ACCOUNT NUMBER:				
Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS				
				NAME: Stup, J.L. NAME: Crampton, K.T.				
22. KEYWORD (Printed each with Security Classification Code) (U) Ultrasonic; (U) Non-Invasive; (U) Foreign Body; (U) Locator								
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS (Printed individual paragraphs identified by number. Proceed rest of work with Security Classification Code.)								
23. (U) A need exists for a non-invasive, portable device for locating metallic and non-metallic foreign bodies in combat patients for use at field military hospitals.								
24. (U) An existing technique utilized for range and altitude information employed in the radio frequency part of the spectrum will be modified to operate in the ultrasonic range. By suitable selection at the fixed and variable parameters, the information will be shifted from the frequency domain to the spacial domain and this will eliminate the need for sophisticated spectral analysis equipment.								
25. (U) None.								
POC:DA								

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SCRTY ^b	6. WORK SECURITY ^b	7. REGRADING ^b	8. DSB'R INSTN ^b	9. SPECIFIC DATA-CONTRACTOR ACCESS	10. LEVEL OF SUM
NA	A. NEW	U	U	NA	NL	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
11. NO. CODES ^a PROGRAM ELEMENT				PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER	
A. PRIMARY 61101A				3A161101A91C	00	015 APC F159	
B. CONTRIBUTING							
C. CONTRIBUTING							
11. TITLE (Pecede with security classification code) (U) Development of System for Laboratory Evaluation of Integrated Pest Management Potential for Black Flies (Simuliidae)							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 005900 Environmental Biology; 002600 Biology							
13. START DATE 7810		14. ESTIMATED COMPLETION DATE 8009		15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GANT		EXPIRATION		18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)
A. DATES/EFFECTIVE:				FISCAL YEAR	78 CURRENT	0.0	00
B. NUMBER:					79	0.3	10
C. TYPE:		D. AMOUNT:		E. CUM. AMT.			
F. KIND OF AWARD:							
21. RESPONSIBLE DOD ORGANIZATION				22. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR /Junior SEAR if U.S. Army/other institution NAME: Kardatzke, J.T. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Schiefer, B.A. NAME: POC:DA			
23. GENERAL USE Foreign Intelligence Not Applicable							
24. KEYWORDS (Pecede each with security classification code) (U) Disease Vectors; (U) Arthropod Control; (U) Integrated Control; (U) Black Flies							
25. TECHNICAL OBJECTIVE, 26. APPROACH, 27. PROGRESS (Pecede individual paragraphs identified by number, precede rest of each with security classification code.)							
23. (U) To develop a system for laboratory evaluation of integrated pest management potential for black flies (Simuliidae).							
24. (U) Using basic research provided through literature resources as models, an experimental system will be developed to maintain a viable population of black flies in the laboratory. Laboratory evaluations using the system will subsequently be preliminary to field evaluations of control measures showing greatest potential as components of an integrated black fly management program.							
25. (U) None.							

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL DD-DR&E(AR)036	
3. DATE PREV SUMMARY NA	4. KIND OF SUMMARY A. NEW	5. SUMMARY SCRTY ^c U	6. WORK SECURITY ^c U	7. REGRADING ^d NA	8. DA DISSEM INSTN ^e NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
10. NO./CODES ^f a. PRIMARY b. CONTRIBUTING c. CONTRIBUTING		PROGRAM ELEMENT 6T1101A		PROJECT NUMBER 3A161101A91C		TASK AREA NUMBER 00	
						WORK UNIT NUMBER 065 APC F160	
11. TITLE (Provide with Security Classification Code) (U) Miniature Device for Monitoring Patients							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment; 002400 Bioengineering							
13. START DATE 7810		14. ESTIMATED COMPLETION DATE 7909		15. FUNDING AGENCY DA		16. PERFORMANCE METHOD C. In-House	
17. CONTRACT/GRANT				18. RESOURCES ESTIMATE			
a. DATES/EFFECTIVE: EXPIRATION:		b. PROFESSIONAL MAN YRS FISCAL YEAR 78		c. FUND\$ (in thousands) 0.0		d. FUND\$ (in thousands) 00	
b. NUMBER: c. TYPE: d. KIND OF AWARD:		e. AMOUNT: f. CUM. AMT. 79		0.2		10	
19. RESPONSIBLE DOD ORGANIZATION				20. PERFORMING ORGANIZATION			
NAME ^g US Army Medical Bioengineering Research & Development Laboratory ADDRESS ^g Fort Detrick, Frederick, MD 21701				NAME ^g US Army Medical Bioengineering Research & Development Laboratory ADDRESS ^g Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (PUNISH SEAN II U.S. ACADEMIC INSTITUTION) NAME: Altman, R.G. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER:			
21. GENERAL USE Foreign Intelligence Not Applicable				ASSOCIATE INVESTIGATORS NAME: Salisbury, L.L., Jr. NAME: POC:DA			
22. KEYWORDs (Provide EACH with Security Classification Code) (U) Biofeedback; (U) Heart Rate; (U) Respiration; (U) Temperature							
23. TECHNICAL OBJECTIVE, ^h 24. APPROACH, 25. PROGRESS (Punish individual paragraphs identified by number. Precede rest of each with Security Classification Code.)							
23. (U) To show feasibility for a miniature device for monitoring patients capable of triggering an audible alarm if respiration, heart rate or temperature deviates from preset limits.							
24. (U) To identify suitable sensors for respiration and temperature which could be used in connection with a commercial device for heart rate biofeedback. To develop the necessary signal conditioning and output circuitry for an integrated system for all three parameters.							
25. (U) None.							

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ²	2. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY NA	4. KIND OF SUMMARY A. NEW	5. SUMMARY SECY ³ U	6. WORK SECURITY ³ U	7. REGRADING ⁴ NA	8. DA DISBN INSTRN ⁵ NL	9. SPECIFIC DATA ⁶ <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT
10. NO./CODES ⁷ B. PRIMARY 61101A		PROGRAM ELEMENT PROJECT NUMBER 3A161101A91C		TASK AREA NUMBER 00		WORK UNIT NUMBER 066 APC F161	
11. TITLE (Provide with Security Classification Code) (U) Evaluation of the Buffering Capacity of Microorganisms in Wastewater Treatment Biological Processes							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 003300 Chemical Engineering; 003400 Civil Engineering							
13. START DATE 7810	14. ESTIMATED COMPLETION DATE 7909		15. FUNDING AGENCY DA		16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GRAANT			18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)
21. DATES/EFFECTIVE: EXPIRATION:			FISCAL YEAR	78 CURRENT	0.0	00	
22. NUMBER ⁸				79	0.3	13	
23. TYPE: F. CUM. AMT.			24. PERFORMING ORGANIZATION				
25. RESPONSIBLE DOO ORGANIZATION			NAME ⁹ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁹ Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434			NAME ⁹ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ⁹ Fort Detrick, Frederick, MD 21701				
26. GENERAL USE Foreign Intelligence Not Applicable			PRINCIPAL INVESTIGATOR /PUNICIAN FOR U.S. ACADEMIC INSTITUTION NAME: Miller, R.D. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: POC:DA				
27. KEYWORD (Provide Each with Security Classification Code) (U) Sanitary Engineering; (U) Wastewater Treatment; (U) Buffering Capacity; (U) Biological Process							
28. TECHNICAL OBJECTIVE, ¹⁰ 29. APPROACH, 30. PROGRAM (Provide individual paragraphs identified by number. Provide last at each with security classification code)							
23. (U) To establish the relative buffering capacity of the three biological wastewater treatment processes: activated sludge, rotating biological contactor, and trickling filter. The relative effects of high pH to the microorganisms in the three systems will be evaluated. pH and carbon dioxide gradients near the micro-organisms will be quantified.							
24. (U) Laboratory scale studies will be conducted to evaluate changes on the pH and buffering capacity of wastewaters after being subjected to treatment by the biological processes. Analyses of the microorganisms during and after exposure to high pH wastewaters will be conducted to quantify effects.							
25. (U) None.							

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL
5. DATE PREV SUMMARY	6. KIND OF SUMMARY	7. SUMMARY SECY ^b	8. WORK SECURITY ^b	DA OB 6242	10 01 78	DD-DR&E(AR)636
NA	A. NEW	U	U	NA	NL	9. LEVEL OF SUM
				10. REGRADING ^b		10. DISBN INSTRN
				11. SPECIFIC DATA - CONTRACTOR ACCESS		12. WORK UNIT
				<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	
				13. NO./CODES ^a PROGRAM ELEMENT		
				PROJECT NUMBER		
				TASK AREA NUMBER	WORK UNIT NUMBER	
				00	067 F162	
14. TITLE (Prefixes with Security Classification Code) ^b (U) Analytical Methods for Pesticides in Aqueous Wastes from Army Pest Control Operations						
15. SCIENTIFIC AND TECHNOLOGICAL AREAS ^a 007800 Hygiene and Sanitation; 002400 Bioengineering						
16. START DATE		17. ESTIMATED COMPLETION DATE		18. FUNDING AGENCY	19. PERFORMANCE METHOD	
7810		7909		DA	C. In-House	
20. CONTRACT/GRAANT						
21. DATES/EFFECTIVE:		EXPIRATION:		22. RESOURCES ESTIMATE		
22. NUMBER:				FISCAL	23. PROFESSIONAL MAN YRS	24. FUNDS (in thousands)
23. TYPE:		24. AMOUNT:		YEAR	PRECEDING	00
24. KIND OF AWARD:		25. CUM. AMT.:		CURRENT	78	0.0
26. RESPONSIBLE DOD ORGANIZATION						
NAME ^a : US Army Medical Bioengineering Research & Development Laboratory ADDRESS ^a : Fort Detrick, Frederick, MD 21701						
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434						
27. GENERAL USE Foreign Intelligence Not Applicable						
28. RECORDS (Prefix each with Security Classification Code) (U) Carbaryl; (U) Sevin; (U) Pesticide Analysis; (U) Analytical Methods; (U) Pesticides						
29. TECHNICAL OBJECTIVE, 30. APPROACH, 31. PROGRESS (Prefix individual paragraphs identified by number. Prefix rest of each with Security Classification Code.) 23. (U) To develop acceptable analytical methods for the routine analysis of pesticides in aqueous wastes from Army pest control operations. There is a requirement for analytical methods for carbaryl and chlordane in wastewater resulting from the pesticide filtration system being developed by the Army for use at Ft. Eustis, VA.						
24. (U) Analytical methods are available for analysis of carbaryl and chlordane in water. However, these methods are time consuming and are not easily adapted to routine analysis of large numbers of aqueous samples. Laboratory studies will be performed to modify and improve current gas and liquid chromatographic methods. The improved procedures should provide reproducible and accurate analysis of 30 to 40 samples per day.						
25. (U) None.						

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^a	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL	
3. DATE PREV SUMMARY NA	4. KIND OF SUMMARY A. NEW	5. SUMMARY SECY ^c U	6. WORK SECURITY ^d U	7. REGRADING ^e NA	8. DISSEM INSTRN NL	9. SPECIFIC DATA ^f CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A WORK UNIT
10. NO./CODES: A. PRIMARY 61101A				PROJECT NUMBER 3A161101A91C		TASK AREA NUMBER 00	
B. CONTRIBUTING						WORK UNIT NUMBER 068 APC F163	
C. CONTRIBUTING							
11. TITLE (Provide with Security Classification Code) (U) Data Acquisition and Monitoring Control System Computational Capability Development							
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 004200 Computers; 009700 Mathematics and Statistics							
13. START DATE 7810	14. ESTIMATED COMPLETION DATE 8010		15. FUNDING AGENCY DA		16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GRANT			18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN YRS		
A. DATES/EFFECTIVE:			FISCAL YEAR	PREVIOUS	0.0	00	
B. NUMBER: C. TYPE:			CURRENT	78	0.2		13
D. KIND OF AWARD:			E. CUM. AMT.	79			
20. RESPONSIBLE DOD ORGANIZATION				21. PERFORMING ORGANIZATION			
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434				PRINCIPAL INVESTIGATOR (Provide name if U.S. Academy/Institution) NAME: Small, M.J. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:			
22. GENERAL USE Foreign Intelligence Not Applicable				POC:DA			
23. KEYWORDS (Provide each with Security Classification Code) (U) Data Acquisition; (U) Data Recall; (U) Minicomputer Systems; (U) Sensors; (U) Programming							
24. TECHNICAL OBJECTIVE, ^g 25. APPROACH, 26. PROGRESS (Punctuate individual paragraphs identified by number. Provide code of each with Security Classification Code.)							
23. (U) The Data Acquisition Monitoring and Control System (DAMCS) was developed to support a direct wastewater reuse pilot plant effort. The program objective is to use the DAMCS System capabilities to support several other projects of this laboratory by means of sensor data acquisition, storage and recall, computer program development, and ancillary data processing assistance.							
24. (U) The Advanced Wastewater Treatment Pilot Plant facilities will be evaluated for the installation of analog or digital sensors for DAMCS processing. Programs will be written for interactive use by Analytical Chemistry personnel at the analytical facilities with direct link to the DAMCS. Analytical chemistry requirements needing computer assistance will be studied with recommended method of approach (type system to support), the necessary programs and user instructions.							
25. (U) None.							

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION # DA OB 6220	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SURVEY 77 10 01	4. KIND OF SUMMARY H. TERMINATION U	5. SUMMARY ACTY U	6. WORK SECURITY U	7. REGRADING NA	8. DOD/N INSTRN NL	9. SPECIFIC DATA - CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES: a. PRIMARY 61101A	PROGRAM ELEMENT PROJECT NUMBER 3A161101A91C			TASK AREA NUMBER 00	11. WORK UNIT NUMBER 300 APC F153	
b. CONTRIBUTING						
c. CONTRIBUTING						
12. TITLE (Punctate with Security Classification Code) (U) Cockroach Surveillance Devices						
13. SCIENTIFIC AND TECHNOLOGICAL AREA 005900 Environmental Biology; 009800 Medical and Hospital Equipment						
14. START DATE 7710	15. ESTIMATED COMPLETION DATE 7809	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRANT		19. RESOURCES ESTIMATE		20. PERFORMANCE ORGANIZATION		
a. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	MEETING	a. PROFESSIONAL MAN YRS 78	b. FUNDS (in thousands) 09	
b. NUMBER:			CURRENT	79	0.0	
c. TYPE:	d. AMOUNT:					
e. KIND OF AWARD:	f. CUM. AMT.					
21. RESPONSIBLE DOO ORGANIZATION		22. PERFORMING ORGANIZATION		23. PRINCIPAL INVESTIGATOR (PUNCIATE NAME IF U.S. GOVERNMENT)		
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: Desrosiers, R.E.		
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		TELEPHONE: (301) 663-7237; AUTOVON 343-7237		SOCIAL SECURITY ACCOUNT NUMBER:		
24. GENERAL USE Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS NAME: Schiefer, B.A. NAME: Driggers, D.P.		POC:DA		
25. APPROACH, PROGRESS (Punctate individual paragraphs identified by number. Punctate rest of work with Security Classification Code)						
23. (U) To develop cockroach survey devices for use by military or civilian entomologists, environmental health technicians and pest control operators.						
24. (U) Commercially available and/or prototype devices will be identified and/or designed and fabricated. Initial field evaluations will be conducted by US Army Medical Bioengineering Research & Development Laboratory personnel and subsequently by potential user agencies.						
25. (U) 7710 - 7809. This task is terminated with completion of evaluation of the Roatel, Zoecon Detector, Mr. Sticky, and the Shock'M'All cockroach traps. A technical report has been written recommending either the Zoecon Detector or Mr. Sticky trap for routine control surveillance. Traps are comparable and should be selected on an availability basis. The Roatet trap is suggested for use in collecting specimens for resistance testing.						

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁹	2. DATE OF SUMMARY ¹⁰	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY SECY ¹¹ U	6. WORK SECURITY ¹² U	7. REGRADING ¹³ NA	8. DISSEM INSTRNM ¹⁴ NL	9. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ¹⁵ PROGRAM ELEMENT A. PRIMARY 61101A				PROJECT NUMBER 3A161101A91C	TASK AREA NUMBER 00	WORK UNIT NUMBER 306 APC F140
B. CONTRIBUTING						
C. CONTRIBUTING						
11. TITLE / Proceeds with Security Classification Code ¹⁶ (U) Short-Term Screening Test Using Photobacteria						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 010100 Microbiology; 012600 Pharmacology; 016800 Toxicology						
13. START DATE 7610	14. ESTIMATED COMPLETION DATE 7909	15. FUNDING AGENCY DA	16. PERFORMANCE METHOD C. In-House			
17. CONTRACT/GRAANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS		
A. DATES/EFFECTIVE:		FISCAL YEAR	PROGRESSING	78	0.4	05
B. NUMBER ¹⁷		CURRENT		79	0.1	03
C. TYPE:		E. AMOUNT:		F. FUNDS (In thousands)		
D. KIND OF AWARD:		F. CUM. AMT.				
18. RESPONSIBLE DOD ORGANIZATION		19. PERFORMING ORGANIZATION				
NAME ¹⁸ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ¹⁹ Fort Detrick, Frederick, MD 21701		NAME ²⁰ US Army Medical Bioengineering Research & Development Laboratory ADDRESS ²¹ Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR /PUNISH NAME IF U.S. Academic Institution NAME: Shiotsuka, R.N. TELEPHONE: (301) 663-7207; AUTOVON 343-7207 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATOR NAME: Rowlett, C.D. NAME:		POC:DA		
21. GENERAL USE Foreign Intelligence Not Applicable						
22. KEYWORD / Proceeds with Security Classification Code ²² (U) Bioassay; (U) Photobacteria						
23. TECHNICAL OBJECTIVE, 24. APPROACH, 25. PROGRESS / Proceeds Individual paragraphs identified by number. Proceeds rest of work with Security Classification Code ²³						
23. (U) To study the feasibility of using photobacteria as a short-term screening system for toxicity.						
24. (U) A colony of the test organism shall be grown in an aqueous medium. Baseline bioluminescent activity shall be measured. Chemicals for which mammalian or aquatic toxicity are available will be tested. Dose-response curve will be used to estimate the ED50 (effective dose 50). All species studied will be examined by the scanning electron microscope.						
25. (U) 7710 - 7809. Eight species of luminescent bacteria were tested and 7 grew well in the liquid media. Luminescent activity after seeding of a fresh medium was measured to establish a baseline for each species. The photobacteria <u>pierantonii</u> and <u>harveyi</u> were selected for further testing because of reproducible baseline activity.						

DETAIL SHEET

TITLE: Short-Term Screening Test Using Photobacteria

WORK UNIT NO: 306

AGENCY ACCESSION NO: DA OB 6197

PRINCIPAL INVESTIGATOR: Shiotsuka, R.N.

BACKGROUND

The toxicologic assessment of chemicals produced by the Army such as trinitrotoluene or used in training exercises, such as hexachloroethane smoke mixtures, require approximately 4 years and cost more than a million dollars per compound. All potentially hazardous chemicals cannot be tested because of time and funding constraints. Therefore, there is a need for a battery of relatively inexpensive short-term tests to serve as an initial screen. Those which appear to pose the greatest toxicologic hazards should then be submitted to more definitive mammalian toxicologic testing.

The model selected for evaluation as a potential short-term screening system is the photobacteria. This system was selected because photobacteria have very short "life" cycles and an easily measured parameter (luminescence) of viability. Thus, the objective of this study is to determine the feasibility of using the luminescent activity of photobacteria as a short-term screening system for toxicity.

PROGRESS

1. Eight species of bioluminescent bacteria were shown to grow and luminesce in a liquid media.
2. Baseline luminescent activity has been established for Photobacterium pierantonii and Lucibacterium harveyi.
3. The Liquid Scintillation Counter has been adapted to measure luminescence.
4. Photobacterium pierantonii and Lucibacterium harveyi have been prepared for observation using the scanning electron microscope.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ^b	2. DATE OF SUMMARY ^b	REPORT CONTROL SYMBOL
3. DATE PREV SUMMARY	4. KIND OF SUMMARY	5. SUMMARY SECY ^b	6. WORK SECURITY ^b	DA OB 6198	78 10 01	DD-DR&E(AR)636
77 10 01	K. COMPLETION	U	U	NA	NL	
10. NO./CODES: ^a b. PRIMARY		PROGRAM ELEMENT		PROJECT NUMBER	TASK AREA NUMBER	WORK UNIT NUMBER
6. CONTRIBUTING				3A161101A91C	00	307 APC F141
c. CONTRIBUTING						
11. TITLE (Provide with Security Classification Code) (U) Mechanisms for the Chemical Degradation of Military Pesticide Formulations						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS ^a 007800 Hygiene and Sanitation; 003300 Chemical Engineering; 003400 Civil Engineering						
13. START DATE 7610	14. ESTIMATED COMPLETION DATE 7809	15. FUNDING AGENCY DA		16. PERFORMANCE METHOD C. In-House		
17. CONTRACT/GRAANT		18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS	20. FUNDS (In thousands)		
a. DATES/EFFECTIVE: b. NUMBER: c. TYPE: d. KIND OF AWARD:		EXPIRATION: FISCAL YEAR	0.2	11		
		4. AMOUNT: C. CUM. AMT. 78	0.0	00		
21. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		22. PERFORMING ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Punish 32AN if U.S. Academic Institution) NAME: Meier, E.P. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Cooper, W.J. NAME: Dennis, W.H.				
23. GENERAL USE Foreign Intelligence Not Applicable				POC:DA		
24. KEY WORDS (Provide each with Security Classification Code) (U) Chemical Degradation; (U) Mechanisms; (U) Pesticides; (U) Solid Waste; (U) Ultimate Disposal; (U) Chlorine Chemistry						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 28. PROGRESS (Punish individual paragraphs identified by number. Provide each with Security Classification Code)						
23. (U) To define and explain the mechanisms for the chemical degradation of diazinon and similar compounds by HOCl and for the catalytic dechlorination of organochlorine pesticides using nickel and sodium borohydride. These reactions have been identified as potential methods for chemical degradation of excess military pesticides and pesticide formulations.						
24. (U) Methods for degradation of diazinon using aqueous HOCl (Clorox) and for the catalytic dechlorination of DDT, heptachlor and chlordane, and lindane have been developed by USAMBRDL. Mechanisms for the chemical reactions have been proposed but not investigated in detail. Laboratory studies will be performed to identify intermediate products and to explain the mechanisms for their production.						
25. (U) 7710 - 7809. PCB's can be completely dechlorinated by the nickel boride-catalyzed reaction in isopropanol. Acute toxicity studies with DDT and chlordane formulations, before and after treatment by nickel boride-catalyzed dechlorination, indicate that this treatment does considerably reduce the toxicity of the formulations. However, the reduction in toxicity was not sufficient to recommend nickel boride-catalyzed dechlorination for disposal of DDT and chlordane. Dechlorination of lindane by this method appears to have potential as a chemical disposal procedure.						

DETAIL SHEET

TITLE: Mechanisms for the Chemical Degradation of Military Pesticide Formulations

WORK UNIT NO: 307

AGENCY ACCESSION NO: DA OB 6198

PRINCIPAL INVESTIGATOR: Meier, E.P.

BACKGROUND

Methods for degradation of diazinon with aqueous HOCl (Clorox^R) and for the catalytic dechlorination of DDT, heptachlor and chlordane, and lindane have been developed by USAMBRDL. The mechanisms for the chemical reactions involved in these methods were proposed but not investigated in detail. No toxicity studies had been done with the nickel boride catalyzed dechlorination system to verify its ability to detoxify chlorinated pesticides. The first objective of this study is to define and explain the mechanisms for Clorox^R degradation of diazinon and for the nickel boride catalyzed dechlorination of organochlorine pesticides. The second objective is to evaluate the ability of the catalyzed dechlorination method to reduce the toxicity of organochlorine pesticides.

PROGRESS

1. Military formulations of lindane were successfully dechlorinated with the nickel borohydride system.
2. Three solvent systems (ethanol, methanol and 2-propanol) were shown to be acceptable for dechlorination of lindane.
3. Acute aquatic toxicity studies have demonstrated that the nickel boride catalyzed dechlorination of DDT and chlordane formulations results in a significant reduction in toxicity of these pesticides. However, the reduction in toxicity was not sufficient to warrant use of this method for disposal of DDT and chlordane.
4. USAMBRDL Technical Report 7702, "Nickel Boride Catalyzed Dechlorination of Several Organochlorine Pesticides" was published.

5. A paper entitled "Acute Toxicity of Dechlorinated DDT, Chlordane and Lindane to Bluegill (Lepomis macrochirus) and Daphnia magna" was accepted for publication in the Bulletin of Environmental Contamination and Toxicology.
6. PCB's were shown to be completely dechlorinated by the nickel boride-catalyzed dechlorination system.
7. A draft publication, "Catalytic Dechlorination of Organochlorine Compounds. VI. Polychlorinated Biphenyls-AROCHLOR 1254" has been prepared for publication in the open literature.
8. Mechanistic studies of the diazinon:HOCl system were discontinued because of the difficulty in analyzing the proposed intermediates.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION# DA OB 6200	2. DATE OF SUMMARY 78 10 01	REPORT CONTROL SYMBOL DD-DR&E(AR)636
3. DATE PREV SUMMARY 77 10 01	4. KIND OF SUMMARY D. CHANGE	5. SUMMARY ACTY U	6. WORK SECURITY U	7. REGADING NA	8. DA DISBN INSTRN NL	9. SPECIFIC DATA: CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES: a. PRIMARY 61101A	PROGRAM ELEMENT	PROJECT NUMBER 3A161101A91C		TASK AREA NUMBER 00	11. WORK UNIT NUMBER 308 APC F142	
b. CONTRIBUTING						
c. CONTRIBUTING						
12. TITLE / (Printed with Security Classification Code) (U) Mechanism of Disinfection and Action of Free and Combined Chlorine on Biological Materials						
13. SCIENTIFIC AND TECHNOLOGICAL AREAS 007800 Hygiene and Sanitation; 003400 Civil Engineering						
14. START DATE 7710	15. ESTIMATED COMPLETION DATE 7909	16. FUNDING AGENCY DA	17. PERFORMANCE METHOD C. In-House			
18. CONTRACT/GRANT		19. RESOURCES ESTIMATE		20. FUNDING (In thousands)		
a. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PREVIOUS CURRENT	a. PROFESSIONAL MAN YRS 0.2	b. FUNDS 11	
b. NUMBER:			79	b. PROFESSIONAL MAN YRS 0.3	b. FUNDS 15	
c. TYPE:	d. AMOUNT:					
e. KIND OF AWARD:	f. CUM. AMT.:					
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701		NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701				
RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Printed name if U.S. Academic institution) NAME: Dennis, W.H. TELEPHONE: (301) 663-2036; AUTOVON 343-2036 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME: POC:DA				
23. KEYWORD / (Printed each with Security Classification Code) (U) Disinfection; (U) Virology; (U) Mechanism; (U) Chlorination; (U) Water						
24. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Printed individual paragraphs identified by number. Provide last of each with security Classification Code.)						
23. (U) To investigate the chemical reactions occurring in a virus undergoing disinfection by free or combined chlorine. To determine the loci of chlorine interaction with nucleic acids. To study the reactions of chlorine with biological materials and determine products of such reactions under the conditions of water disinfection.						
24. (U) Aqueous solutions of f2 virus will be disinfected with H036Cl or NH236Cl between pH 5 and 10. The RNA of inactive f2 will then be isolated, hydrolyzed and subjected to electrophoresis to determine which nucleotides chemically bind chlorine. The interaction of chlorine with biological materials will be studied; reactions of purine and pyrimidine analogs will be emphasized.						
25. (U) 7710 - 7809. During FY78 three reports were prepared for publication: "Reaction of Nucleotides with Hypochlorous Acid," "Reaction of Uracil with Hypochlorous Acid," and "Mechanism of Disinfection: Incorporation of Cl-36 into f2 virus." The reaction products of the reaction of uracil, uridine and uridine monophosphate were determined. It was found that trichloroacetic acid is produced during the water treatment process. The mean level of trichloroacetic acid in Fort Detrick tapwater is 50 ppb.						
309						
*Available to contractors upon contractor's request.						

DETAIL SHEET

TITLE: Mechanism of Disinfection and Action of Free and Combined Chlorine
on Biological Materials

WORK UNIT NO: 308

AGENCY ACCESSION NO: DA OB 6200

PRINCIPAL INVESTIGATOR: Dennis, W.H.

BACKGROUND

The importance of chlorination of water supplies for the prevention of water-borne diseases impels an understanding of the manner in which chlorine acts upon viruses and other biological materials. At present, improvements in the disinfection process are mainly sought empirically. However, if the mechanism by which chlorine species inactivate viruses could be determined, then this knowledge could lead to the optimization of chlorine use or better define the conditions under which disinfection might be improved.

Studies were initiated in FY 77 to understand the disinfection process on the molecular level. Chlorine was found to bind chemically to the RNA of f2 virus. Furthermore, the rate of chlorine addition to f2 paralleled the rate f2 inactivation. Chlorine was found to react with all nucleotides except uridine monophosphate.

PROGRESS

1. The reaction rates of four nucleotides with aqueous chlorine were completed between pH 5 and 10.
2. The reaction of uracil, uridine, uridine monophosphate and yeast RNA with hypochlorous acid yields trichloroacetic acid.
3. Trichloroacetic acid has been found in tapwater at a level of 50 ppb (17 determinations) and is apparently formed during chlorination of finished water prior to distribution.
4. Three papers were prepared for publication covering all work carried out to date.

REFERENCES

1. Dennis, W.H., V.P. Olivieri and C.W. Kruse' "Reaction of Uracil with Hypochlorous Acid," Biochem. Biophys. Res. Comm., 83, 168-171 (1978).
2. Dennis, W.H., V.P. Olivieri and C.W. Kruse', "Mechanism of Disinfection: Incorporation of Cl-36 Into f2 Virus," submitted to Water Research.
3. Dennis, W.H., V.P. Olivieri and C.W. Kruse', "Reaction of Nucleotides with Aqueous Hypochlorous Acid," submitted to Water Research.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION ⁸	2. DATE OF SUMMARY ⁹	REPORT CONTROL SYMBOL
3. DATE PREV SUMRY 77 10 01	4. KIND OF SUMMARY H. TERMINATION	5. SUMMARY SECY ¹⁰ U	6. WORK SECURITY ¹¹ U	DA OB 6202	78 10 01	DD-DR&E(AR)826
7. REGRADE ¹² NA	8. DISP'DN INSTRN ¹³ NL	9. SPECIFIC DATA- CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	10. LEVEL OF SUM A. WORK UNIT			
10. NO./CODES: ¹⁴ a. PRIMARY 611101A	PROGRAM ELEMENT PROJECT NUMBER 3A161101A91C	11. TASK AREA NUMBER 00	12. WORK UNIT NUMBER 310 APC F130			
13. TITLE (Precede with Security Classification Code) (U) Non-Auditory Dependent Blood Pressure Measurement Techniques						
14. SCIENTIFIC AND TECHNOLOGICAL AREAS 009800 Medical and Hospital Equipment						
15. START DATE 7610	16. ESTIMATED COMPLETION DATE 7810	17. FUNDING AGENCY DA	18. PERFORMANCE METHOD C. In-House			
19. CONTRACT/GANT	20. RESOURCES ESTIMATE	21. PROFESSIONAL MAN YRS 0.1	22. FUND'S (In thousands) 02			
a. DATES/EFFECTIVE: b. NUMBER: c. TYPE: d. KIND OF AWARD:	EXPIRATION: FISCAL YEAR 78 CURRENT 79	e. AMOUNT: F. CUM. AMT.	23. PERFORMING ORGANIZATION			
24. RESPONSIBLE DOD ORGANIZATION NAME: US Army Medical Bioengineering Research & Development Laboratory ADDRESS: Fort Detrick, Frederick, MD 21701	25. PRINCIPAL INVESTIGATOR (Punish 25AP II U.S. Academic Institutions) NAME: Salisbury, L.L. TELEPHONE: (301) 663-7277; AUTOVON 343-7277 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: NAME:					
26. RESPONSIBLE INDIVIDUAL NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434	27. POC:DA					
28. KEYWORD (Precede each with Security Classification Code)	(U) Blood Pressure; (U) Pressure Detection; (U) Sphygmomanometer; (U) Korotkov					
29. TECHNICAL OBJECTIVE, 30. APPROACH, 31. PROGRESS (Punish individual paragraphs identified by number. Precede each with Security Classification Code.)						
23. (U) To develop a method of obtaining blood pressure readings of critical patients in the high noise environments of emergency evacuation vehicles (helicopter, ambulance, etc.) where Korotkov sounds can not be heard.						
24. (U) A standard Sphygmomanometer will have a pressure transducer installed in the pressurizing line. The pressure variations induced in the line when the cuff pressure is in the range of the blood pressure will be detected. Electronic processing will provide a visual signal at the on-set of pulsations (systolic) and remove the visual signal when the pulsation coincide with diastolic. The visual signal will cue the taking of pressure readings just as the Korotkov sounds do now and can be used in conjunction with the sounds where ambient noise permits use of conventional stethoscope.						
25. (U) 7710 - 7809. An I.C. pressure transducer (National Semi-Conductor L X 1602G) is used to detect cuff pressure. Capacity coupling permits separation of the pulsatile pressure from the steady state cuff pressure. Additional gain and low pass filtering provides good replication of the blood pressure wave form. Because of individual variations simple electronic techniques have not provided reliable correlation with Korotkov sounds. More sophisticated techniques were tried. A commercial item developed by DINAMAP, Inc. has recently been introduced. This micro-processor unit provides the same information in a high noise environment. Therefore, this effort is terminated.						

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV. SURVEY	4. KIND OF SUMMARY	5. SUMMARY SCRTY	6. WORK SECURITY	DA 0B 6203	78 10 01	DD-DR&E(AR)636
77 10 01	D. CHANGE	U	U	NA	NL	
7. NO. CODES*	PROGRAM ELEMENT	PROJECT NUMBER		8. REGRADING*	9. OTHER INSTN#	10. SPECIFIC DATA*
6. PRIMARY	61101A	3A161101A91C		00		CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
8. CONTRIBUTING						11. LEVEL OF SUM
9. CONTRIBUTING						A. WORK UNIT

12. TITLE (Provide with security classification code)*

(U) Sterilization Techniques Using High Boiling-Point Fluids

13. SCIENTIFIC AND TECHNOLOGICAL AREA*

010100 Microbiology; 009800 Medical and Hospital Equipment

14. START DATE	15. ESTIMATED COMPLETION DATE	16. FUNDING AGENCY	17. PERFORMANCE METHOD
7609	7909	DA	C. In-House
18. CONTRACT/GANT			
19. DATES/EFFECTIVE:	EXPIRATION	20. RESOURCES ESTIMATE	21. PROFESSIONAL MAN YRS
22. NUMBER:		FISCAL YEAR	23. FUNDS (In thousands)
24. TYPE:	25. AMOUNT:	PREVIOUS	
26. A. KIND OF AWARD:	E. CUM. AMT.	TOTAL	
27. RESPONSIBLE DOD ORGANIZATION		78	0.1
NAME* US Army Medical Bioengineering Research & Development Laboratory		79	0.05
ADDRESS* Fort Detrick, Frederick, MD 21701			
RESPONSIBLE INDIVIDUAL			
NAME: Dettor, C.M., COL			
TELEPHONE: (301) 663-2434; AUTOVON 343-2434			
28. GENERAL USE			
Foreign Intelligence Not Applicable			
29. KEYWORD (Provide each with security classification code)			
(U) Sterilizers; (U) Field Sterilizers; (U) Fluids; (U) High Boiling Point			
30. TECHNICAL OBJECTIVE* (See Approach, Progress / Provide individual paragraphs identified by number. Provide code of work with security classification code.)			
23. (U) To search for high boiling-point fluids effective as sterilization media at much lower positive pressures than in current steam sterilization practice.			
24. (U) Complete a literature search for non-toxic, non-corrosive candidate fluids. Modify controls of a standard steam sterilizer to operate at lower positive pressures corresponding to 250-270 F saturation temperatures of these fluids. Measure killing ability with spore strips.			
25. (U) 7710 - 7809. A table top steam sterilizer was operated in the normal manner except that butanol was substituted for water. It was found that sterilizing conditions occurred only in the lower portion of the sterilizer body. It was concluded that the higher density butanol vapor closes the trap before air is removed from the chamber. A tentative design change to the sterilizer employing a stand pipe is considered necessary to obtain sterilization conditions throughout the body.			
31. PERIODIC REPORTS			
32. APPROVALS			
33. COMMENTS			
34. SIGNATURE			

DETAIL SHEET

TITLE: Sterilization Techniques Using High Boiling-Point Fluids.

WORK UNIT NO: 311

AGENCY ACCESSION NO: DA OB 6203

PRINCIPAL INVESTIGATOR: Prensky, W. C.

BACKGROUND

The use of a sterilant with a higher boiling-point than water would allow sterilization at usual temperatures ($\approx 270^{\circ}\text{F}$) but at much lower pressures. This could result in substantial weight and cost reductions in field sterilizers due to thinner pressure chamber walls and in safer equipment.

A literature search for a candidate fluid uncovered only one compound (Butanol) with the desired characteristics; mixtures of fluids have not been investigated. At atmospheric pressure, Butanol boils at 117.6°C (243.7°F) and its saturation pressure at 132°C (269.6°F), a common sterilizing temperature, is 9.6 psi. This compares to a saturation pressure of over 27 psi for water at 132°C .

Two Spectroline Table-Top Sterilizers were acquired and cycles were run using steam sterilization indicators with water as the sterilant. One of the sterilizers suffered a valve failure at this stage. Butanol was then used in the second sterilizer after minor readjustment of its thermal controller. Results appeared normal, but after only four cycles, the same valve failed in the second sterilizer. This valve is believed to be an inherent weakness in the sterilizer design which was not necessarily aggravated by the use of Butanol.

PROGRESS

Sterilizers were repaired and Butanol used as a sterilant. Thermolog S integrating strip indicators were used as an indication of sterilization. When these indicators were placed in the lower trays in the chamber, integration was satisfactory; however, when they were in the upper trays, there was considerably less integration. It was concluded that butanol vapor is denser than air (unlike steam) and would quickly close the steam trap before all of the chamber air could be exhausted due to the location of the trap at the bottom of the sterilizer. It was theorized that this could be corrected in the test sterilizers by adding a standpipe to the trapline so that its input is located high in the chamber. Arrangements have been

TITLE: Sterilization Techniques Using High Boiling-Point Fluids (Cont'd).

made to modify the sterilizers and run additional tests using spore strips to more effectively demonstrate the effectiveness of butanol as a sterilant. Final modifications and tests are planned for FY79.

REFERENCES

None.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				I. AGENCY ACCESSION ²	II. DATE OF SUMMARY ²	REPORT CONTROL SYMBOL
5. DATE PREV SURY	6. KIND OF SUMMARY	7. SUMMARY SCRT ³	8. WORK SECURITY ⁴	DA 0B 6216	78 10 01	DD DR&E (AR) 636
77 10 01	K. COMPLETION	U	U	NA	NL	D. REGRADING ⁵ <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. NO./CODES ⁶		PROGRAM ELEMENT	PROJECT NUMBER	TAKE AREA NUMBER	E. SPECIFIC DATA-CONTRACTOR ACCESS <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
A. PRIMARY	61101A		3A161101A91C	00	F. LEVEL OF SUM A. WORK UNIT 312 APC F151	
B. CONTRIBUTING						
C. CONTRIBUTING						
11. TITLE (Purposely left blank Security Classification Code) ⁷ (U) Compilation and Improvement of Statistical Methods for Binary Responses, the Analysis of Aquatic Field Data and Laboratory Toxicology Data						
12. SCIENTIFIC AND TECHNOLOGICAL AREAS 009700 Mathematics and Statistics; 002600 Biology; 016800 Toxicology						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY	16. PERFORMANCE METHOD			
7710	7809	DA	C. In-House			
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE	19. PROFESSIONAL MAN YRS		20. FUNDS (in thousands)	
A. DATES/EFFECTIVE:	EXPIRATION:	FISCAL YEAR	PRECEDING	78	0.2	05
B. NUMBER ⁸ :	G. AMOUNT:	CURRENCY	79	0.0	00	
C. TYPE:	E. CUM. AMT.					
D. KIND OF AWARD:						
21. RESPONSIBLE DOD ORGANIZATION		22. PERFORMING ORGANIZATION				
NAME ⁹ :	US Army Medical Bioengineering Research & Development Laboratory					
ADDRESS ⁹ :	Fort Detrick, Frederick, MD 21701					
RESPONSIBLE INDIVIDUAL		PRINCIPAL INVESTIGATOR /PUNNING TEAM // U.S. AUTHORITY INVESTIGATOR				
NAME:	Highfill, J.W.					
TELEPHONE:	(301) 663-7207; AUTOVON 343-7207					
23. GENERAL USE		SOCIAL SECURITY ACCOUNT NUMBER				
Foreign Intelligence Not Applicable		ASSOCIATE INVESTIGATORS				
		NAME: Pearson, J.G.				
		NAME: POC:DA				
24. KEYWORD (Purposely left blank Security Classification Code) (U) Binary Response; (U) Statistical Analysis; (U) Aquatic Field Data; (U) Laboratory Toxicology Data						
25. TECHNICAL OBJECTIVE, 26. APPROACH, 28. PROGRESS (Purposely left blank paragraphs identified by number. Purposely left blank Security Classification Code.)						
23. (U) Review existing methods and modify or develop new methods for the analysis of aquatic field data and laboratory toxicology data. Prepare a guide to be used in acute testing with special emphasis on experimental design.						
24. (U) Literature will be reviewed in those areas indicated above for current methods of data analysis. Current methods will be critically examined and modified or new ones developed where warranted. Methods of analysis for acute and chronic laboratory toxicity data will be evaluated with special reference to aquatic toxicity tests.						
25. (U) 7710 - 7809. Completed literature review relating to binary data gathered for toxicological purposes. Obtained access to SAS program for the laboratory. Produced a guide for contractors and in-house personnel relating minimum requirements, design criterion, required analyses, specific examples for acute toxicity tests.						

DETAIL SHEET

TITLE: Compilation and Improvement of Statistical Methods for Binary Responses, the Analysis of Aquatic Field Data and Laboratory Toxicology Data

WORK UNIT NO: 312

AGENCY ACCESSION NO: DA OB 6216

PRINCIPAL INVESTIGATOR: Highfill, J.W.

BACKGROUND

A summary of activity includes two primary areas. One is the collection and evaluation of work relating to median response level from dichotomous responses. The other is the preparation of ideas from data collected in the laboratory and in the field.

Historically, several methods have been given for calculating a measure which would represent an exposure level that would kill one-half of the exposed individuals. One could say that empirical needs and observations preceded much of the mathematical development. Through procedures of estimation, complicated analyses have been presented. Since much of this work was done before computers were available, alternate procedures were developed. This has meant, for relatively new areas like aquatic bioassay, that less than satisfactory methods of analysis have been applied and that some have been applied improperly.

PROGRESS

To date, graphical methods and moving average methods have been evaluated. Both had been used by bioassayists as alternatives to the more statistically sophisticated methods of probit and logit. The work by Finney on probit has been well studied and a new awareness of recent developments in logit exists because of this work. Pertinent, recent statistical articles have been obtained and reviewed.

Some statistical packages for probit estimates were evaluated. One package that looks particularly promising is Statistical Analysis System (SAS). It not only presents the desired statistical summaries but also graphs the data and the weighted regression line. It has options for

plots on the original concentration scale or a transformed concentration scale. SAS is available to the laboratory.

A meeting in Minneapolis, MN, on the data analysis of aquatic field data was attended in May 1977. An applied statistics meeting was attended in Princeton, NJ, in December 1977.

A draft of Guidelines for Contractors Doing Acute Testing has been completed. Its primary purpose is to bridge the gap between the theory in statistics and the background of the researchers. Areas considered in the guide are minimum requirements of running the experiment, the recommended methods of analysis, the reporting of results, and some examples.

RESEARCH AND TECHNOLOGY WORK UNIT SUMMARY				1. AGENCY ACCESSION#	2. DATE OF SUMMARY*	REPORT CONTROL SYMBOL
3. DATE PREV. SURVEY	4. KIND OF SUMMARY	5. SUMMARY ACTV*	6. WORK SECURITY	DA OB 6224	78 10 01	DD-DR&E(AR)636
77 10 01	D. CHANGE	U	U	NA	NL	
10. NO./CODES*	PROGRAM ELEMENT	PROJECT NUMBER		T. REGRADING	8. DISSEM INSTN*	9. SPECIFIC DATA-CONTRACTOR ACCESS
A. PRIMARY	61101A	3A161101A91C		00	DA	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
B. CONTRIBUTING						
C. CONTRIBUTING						
11. TITLE (Print in full Security Classification Code) (U) Development of System for Laboratory Evaluation of Biological Control Potential of Arthropod Pathogens for Medically Important Arthropods						
12. SCIENTIFIC AND TECHNOLOGICAL AREA(S) 005900 Environmental Biology; 002600 Biology						
13. START DATE	14. ESTIMATED COMPLETION DATE	15. FUNDING AGENCY		16. PERFORMANCE METHOD		
7708	7909	DA		C. In-House		
17. CONTRACT/GRANT		18. RESOURCES ESTIMATE		19. PROFESSIONAL MAN-YRS		20. FUNDS (in thousands)
A. DATES/EFFECTIVE	EXPIRATION:	FISCAL	78	1.2	39	
B. NUMBER*		YEAR	79	1.8	72	
C. TYPE	E. AMOUNT:	21. PERFORMING ORGANIZATION				
D. KIND OF AWARD:	F. CUM. AMT.	NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
22. RESPONSIBLE DOD ORGANIZATION		NAME* US Army Medical Bioengineering Research & Development Laboratory ADDRESS* Fort Detrick, Frederick, MD 21701				
NAME: Dettor, C.M., COL TELEPHONE: (301) 663-2434; AUTOVON 343-2434		PRINCIPAL INVESTIGATOR (Print in full Security Classification Code) NAME: Hembree, S.C. TELEPHONE: (301) 663-7237; AUTOVON 343-7237 SOCIAL SECURITY ACCOUNT NUMBER: ASSOCIATE INVESTIGATORS NAME: Schiefer, B.A. NAME: Nelson, J.H.				
23. GENERAL USE Foreign Intelligence Not Applicable		POC:DA				
24. KEYWORD (Print in full Security Classification Code) (U) Pathobiology; (U) Insect Pathology; (U) Disease Vectors; (U) Arthropod Control; (U) Biological Control; (U) Integrated Control						
25. TECHNICAL OBJECTIVE, APPROACH, PROGRESS (Print in full Security Classification Code)						
23. (U) To develop a system for laboratory evaluation of biological control potential of arthropod pathogens for arthropods of medical importance.						
24. (U) Two protozoan mosquito pathogens of Thai <u>Aedes aegypti</u> will be used as models to develop and test protocols for the preliminary evaluation of the efficiency, safety, mass production potential, storage characteristics, and resistance to denaturation in the environment, of candidate biological control agents for mosquitoes.						
25. (U) 7710 - 7809. Dose-transmission data and dose-mortality data as indices of efficiency have been acquired and the experiments are being repeated and expanded upon. Preliminary experiments indicate a high level of probability that sterile, homogeneous suspensions of spores can be acquired for use in safety testing and in attempts at culturing the pathogens. Storage experiments are underway and indicate one of the pathogens can be frozen for up to 16 weeks with virtually no loss in infectivity. Studies of the developmental cycle and histopathology of the pathogens are nearing completion.						

DETAIL SHEET

TITLE: Development of System for Laboratory Evaluation of Biological Control Potential of Arthropod Pathogens for Medically Important Arthropods

WORK UNIT NO: 315

AGENCY ACCESSION NO: DA OB 6224

PRINCIPAL INVESTIGATOR: Hembree, S.C.

BACKGROUND

The Army is a major user of chemical pesticides in meeting its responsibility to guard the health and welfare of military personnel, dependents, installation inhabitants and military property as required by DoD Dir 4150.7, AR 40-5, AR 200-1, and AR 420-76. The Army is also required by executive orders, departmental directives, and regulations to minimize environmental insult resulting from its activities. It is the current dogma of insect pest management that environmental insults resulting from pest management operations will be minimized by development and implementation of integrated pest management (IPM) methods which minimize use of chemical insecticides (Entomol. Soc. Am. Spec. Publ. 75-2, Aug 75).

By mission statement, it is the responsibility of USAMBRDL to conduct the Surgeon General's program in IPM research. This project represents a first step in the development of mosquito pathogens as components of an IPM program. Agents developed will be integrated with controlled release, biodegradable formulations of conventional pesticides in such a way as to minimize use of chemical pesticides and their attendant environmental problems.

Experience with pathogens currently in commercial use against agricultural and forest insect pests indicates that for successful use pathogens must be efficient, safe, economically producible, amenable to storage and transport, and resistant to degradation by environmental factors such as sunlight. Several hundred mosquito pathogens are known (Bull. WHO, Vol 55, Supplement, 1977), but the usefulness of these in IPM programs is virtually uninvestigated. Numerous studies of mosquito pathogens have been basic in nature, and no research program underway in the United States addresses the full range of challenges involved in evaluating and developing pathogens as components of an integrated pest management system for mosquitoes.

Our approach to this challenge is first to select pathogens for development that have a high probability of success. The large number of mosquito pathogens identified, their diversity, and the dearth of information regarding them require that a screening system be developed to select those with potential usefulness. This system should permit the expedient, inexpensive acquisition of preliminary information regarding: (1) Safety, (2) Efficiency, (3) Mass Production Potential, (4) Storage Properties, and (5) Resistance to Environmental Degradation.

The present study is designed to incorporate information from the current scientific literature with experience gained with two model host-pathogen systems from Thailand in the development of a screening system for the preliminary assessment of biological control potential of mosquito pathogens.

PROGRESS

Biological information necessary for the laboratory manipulation and maintenance of microsporidian (UK10) and helicosporidian (UK2) (Protozoa: Sporozoa) pathogens of Aedes aegypti has been accumulated by experimentation. Production of quantities of spores of both pathogens sufficient for their use as models in the accomplishment of the objective is assured. Spore production in the natural host now proceeds by standardized methods.

Influence of the following parameters on transmission rates has been quantified: dose, duration of exposure, age of larvae at exposure. Production of UK2 spores in Ae. aegypti larvae has been optimized and experiments relative to the optimization of UK10 spores are underway. Accumulation of sectioned and smeared specimens necessary for the life cycle and taxonomic description (including spore ultrastructure) of both pathogens will be completed by end of FY78. Preliminary studies to evaluate the efficiency of both pathogens as biological control agents for Ae. aegypti demonstrated that both agents could cause 100 percent mortality in the host. Percent mortality was directly related to dosage. Time to mortality was inversely related to dosage. Spore production in infected larvae indicated a potential to return to the environment well over one-hundred times as many spores as were used to cause infections. Attempts to store spores of UK10 by freezing with several cryoprotectants were unsuccessful. However, this vertically transmitted pathogen is maintained for at least three months in infected host ova. Spores of UK2 could be frozen for up to three months with little loss of infectivity. Study of long term storage potential of UK2 by freezing is under way. Attempts to acquire homogeneous suspensions of both pathogen spores by centrifugation on silicate gradients gave promising results. A bibliography of over 6000 literature references relative to biological control of arthropods with pathogens has been accumulated as an information resource.

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